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PROGRESSIVE MEDICINE

A QUARTERLY DIGEST OF ADVANCES, DISCOVERIES
AND IMPROVEMENTS

IN THE

MEDICAL AND SURGICAL SCIENCES

EDITED BY

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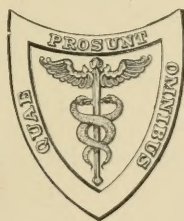
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VOLUME III. SEPTEMBER, 1909

DISEASES OF THE THORAX AND ITS VISCERA, INCLUDING THE HEART, LUNGS
AND BLOODVESSELS—DERMATOLOGY AND SYPHILIS—OBSTETRICS—
DISEASES OF THE NERVOUS SYSTEM



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PROGRESSIVE MEDICINE.

SEPTEMBER, 1909.

DISEASES OF THE THORAX AND ITS VISCERA, INCLUDING THE HEART, LUNGS, AND BLOODVESSELS.

BY WILLIAM EWART, M.D., F.R.C.P.

TUBERCULOSIS.

THE progress of the Clinical Study of Consumption is reflected in the Annual Report of the Henry Phipps Institute in Philadelphia, which has already collected the facts concerning some 5000 cases in connection with its Dispensary, its Hospital of 52 beds for advanced cases, and the White Haven Sanatorium, for the reception of 36 advanced and 160 early cases. The Report deals with the scientific work accomplished with the help of these materials.

The valuable observation has been made that while the non-hemorrhagic sputum of 52 cases showed the pneumococcus in 42 per cent., the blood-streaked or hemorrhagic sputum of 73 cases showed it in 63 per cent.

It has been demonstrated that in exceptional cases a lymphatic anastomosis may exist between the deep cervical lymph nodes and the supra-clavicular glands. These latter probably receive afferent lymph vessels which drain the parietal apical pleura; and this bears upon the etiological question as to the relation between pleural infection and the early lesions of the upper respiratory tract. We are also taught that an infecting focus of the latter, particularly in the tonsils, may give rise to a pure toxemia, or, more rarely, to a bacteremia. It is therefore a possible inference that the faucial tonsils may harbor unrecognizable foci of infection, causing in many individuals a mild toxemia, the importance of which depends upon their resistance. Other investigations are devoted to the study of the blood and of the urine.

The Occurrence of Tubercle Bacilli in the Blood in Tuberculosis. Rosenberger's¹ remarkable discovery has lifted into the practical field of the

¹ American Journal of the Medical Sciences, February, 1909.

clinical laboratory the hitherto neglected study of the blood in individual cases. He was able to demonstrate the bacillus in the blood of every patient, whatever the type of the disease, and however early its clinical appearance. If it be confirmed that living bacilli occur in the blood of practically every tuberculous patient, then all other methods of diagnosis will sink into insignificance as relatively uncertain and late. Moreover, as pointed out by Charles E. P. Forsyth, "our ideas as to the use of tuberculin vaccinothrapy must be considerably modified."

The existence of the bacillemia has been confirmed by Charles E. P. Forsyth's¹ smaller series of 12 cases, by means of the same method, somewhat modified.

After cleansing with liquid soap, alcohol, and ether, a tourniquet is applied, and, with a sterile syringe fitted with a platino-iridium needle previously flamed, about 5 c.c. of blood is drawn from any convenient vein. The blood is at once mixed with about an equal volume of sterile citrated salt solution. The mixture is placed in a swift-running centrifuge for twenty minutes, and some of the deposit taken up on a slide to form a thick film. This is dried in an oven at 60° C., and is then placed in sterile distilled water to lake the blood. Thereafter the film is fixed and stained in the usual way.

Out of the 12 cases, 10 had distinct physical signs and had tubercle bacilli in the sputum. Adopting Turban's classification, there were of Stage I, 3 cases, of Stage II, 6 cases, and of Stage III, 1 case; and all these 10 showed tubercle bacilli free in the blood, though rather difficult to find because few and isolated. The organisms were of the long or short forms, beaded or uniformly stained, and were acid-fast rods morphologically indistinguishable from the tubercle bacillus.

One of the negative cases presented very indefinite features of diagnosis, both as to symptoms and physical signs. In the other, with marked physical signs, the sputum had repeatedly been examined in vain for bacilli. Only 4 of the 10 positive cases had any fever at the time of examination. In the other 6 the temperature was normal, and had been so for many days or weeks, all of them improving, like the usual favorable case of chronic phthisis. The result of cultures and of the inoculation of the infected blood into animals remain to be worked out.

Non-acid-fast Bacilli and Infection.—Much² has shown that there are non-acid-fast tubercle bacilli, occasionally occurring in the nodules of bovine tuberculosis, or old abscesses, and which are infective by inoculation to guinea-pigs. They will not stain with Ziehl's, but only with Gram's stain, which, however, cannot help us in the examination of the sputum, with its hosts of Gram-positive as well as Gram-negative organisms. Great significance probably attaches to Much's success in converting by culture the non-acid-fast into the other, or vice versa, while the viru-

¹ British Medical Journal, April 24, 1909.

² Berl. klin. Woch., April 6, 1908.

lence remains almost the same, though on the whole the greater the virulence the more easy it is to decolorize by acid. Assuming that the acid-fast property is due to the presence within the bacillus of certain fatty acids, the more virulent bacilli may be viewed as containing the less of fatty acid.

Anaphylaxis.—Besredka's¹ theory relates to the curious fact that whereas in the guinea-pig anaphylaxis is produced with small doses of horse serum ($\frac{1}{100}$ to $\frac{1}{200}$ c.c.), large doses (3 to 6 c.c.) not only produce less effect in the direction of anaphylaxis, but actually protect the sensitized guinea-pig against these effects.

He assumes that in every normal serum two properties or substances are present, "sensibilisinogen" and "antisensibilisin," the one possessing the character of an antigen, the other that of an antilysin. The former is thermostable; it has the property of giving rise in the guinea-pig, twelve days after injection, to "sensibilisin" (Richet's "toxogenin"), that is, the substance which creates the anaphylactic state. The anti-sensibilisin is thermolabile; it has the property of combining with the sensibilisin wherever it encounters it, whether the latter be free in the blood or fixed in the nervous system. Anaphylaxis is determined by the violent encounter of antisensibilisin with sensibilisin in the nervous system. This violent conjunction of the two substances can be prevented by a more gradual combination, viz., either by using for inoculation a very large dose of serum, in order that the large amount of anti-sensibilisin present may pick out the sensibilisin gradually as it is in process of being formed (that is, in the pre-anaphylactic period); or else by bringing a very small dose of antisensibilisin into contact with sensibilisin (vaccination by minimal doses of serum in the anaphylactic period).

Auto-inoculation versus Hetero-inoculation.—E. C. Hort's² important paper read before the Royal Society of Medicine invites attention to a neglected factor in our current conceptions as to the causation of disease and the means of immunity, *i. e.*, the factor of the cellular and other derivatives emanating from the host, the evolution of which is collateral to that of the bacterial products.

The importance of the cytotoxic and cytolytic processes in question had not passed altogether unnoticed. It was dwelt upon by Welch, who pointed out in his Huxley lecture, in 1902, that in the process of infection various cytotoxins may be formed, the parasite contributing amboceptors, and either the parasite or the host contributing complements for these cytotoxins.

More recently Eugene L. Opie³ has reported on the action of enzymes in the lesions of tubercle produced by intrapleural bacillary inoculations

¹ Ann. de l'Inst. Pasteur, June, 1908; British Medical Journal Epitome, April 24, 1909.

² March 23, 1909.

³ New York Medical Journal, November 21, 1908.

in animals. "The enzyme peculiar to the polymorphonuclear leukocytes was present a short time after the inoculation, but it diminished in activity quickly. A second enzyme, which digested proteid in a weak acid solution, was present in great abundance until caseation occurred, when it disappeared. The serum of the exudate which accumulated in the chest lost the power possessed by the serum of the blood to inhibit this and similar enzymes. The enzyme which acted in an acid medium was probably present in the epithelioid cells of the tubercle, and was similar to that of the large uninuclear cells of an inflammatory exudate, which the epithelioid cells resembled. Autolysis caused by the enzymes not held in check might explain the occurrence of caseation in poorly vascularized tissues containing the products of the tubercle bacillus."

Hort's inquiry is specially concerned with the therapeutic aspects of the question. He contends that some attention should be given to issues other than the merely bacterial, and he submits:

1. That when nature cures an infection, she converts tissues and bacteria into auto-inoculating agents, and thereby incites both cellular and bacterial restraint.

2. That to provoke the latter, as is done in vaccine treatment (hetero-inoculation), and ignore the former is too often to aim at half and expect the whole.

3. That, whenever practicable, auto-inoculation is the best method to employ when artificial aid is needed.

4. That in thermometric charts and in measurements of the blood's inhibitory powers we have most useful gauges of the presence or absence of many kinds of stimulus and response.

The Antitryptic Index of the Blood in Tuberculosis. The method is that of electric conductivity devised by Victor Henri and practised by Bayliss. As applied by Golla¹ it is capable of great precision. It is based upon the increase in conductivity being proportionate to the amount of tryptic conversion present in the fluid. If, as he provisionally concludes from his series of observations, the antitryptic index of the blood serum in tuberculosis rises considerably in cases which are rapidly deteriorating, while it hardly rises or remains normal in those making good progress, this would be a far more reliable and a decidedly easier method of gauging the clinical situation than the opsonic index. The curve of the antitryptic index claims no direct relationship with the temperature curve, but an indirect connection only.

Gastroptosis in Pulmonary Tuberculosis has hitherto been singularly neglected in the literature of phthisis, although it belongs, almost inevitably, to systematic superalimentation, and is consequently very familiar to gastric observers. B. Reed and F. N. Robinson's² report and warning is therefore opportune. "We should search for and correct any existing visceral displacement as a helpful preliminary to the cure of the major

¹ Lancet, April 3, 1909.

² Southern California Practitioner, November, 1908.

disease; and to prevent the development of tuberculosis in persons predisposed thereto by reason of lowered nutrition, the same precaution is equally important." Of 221 patients under treatment (men, 108; women, 113), 133 were carefully examined abdominally, on account of gastro-intestinal symptoms. In 50 (women, 28; men, 22), or 37.6 per cent., there was more or less prolapse of the stomach. In 44 of the 50 cases the lower border of the stomach was at or below the umbilicus. In 6 of 28 cases in women and 6 of 22 cases in men the lower border rested on the pelvic viscera, and in only 4 cases in women and 2 cases in men was it above the umbilicus. In 10 cases (9 women, 1 man) the gastropotosis was accompanied by a movable right kidney.

Tuberculosis in Children. The "Pretuberculosis Campaign" which I have advocated is shown to be urgent by the facts elicited in the clinical study of children of tuberculous parents by Miller¹ and Woodruff.

The children, whose ages varied from two to fifteen years, with an average age of eight and one-half years, were sent for examination to the clinic, not because of any symptoms of which they complained, but simply as a routine procedure on the part of the visiting nurse. The parents in the majority of instances had not recognized that the child was ill.

Of the 150 cases examined, the results were as follows:

1. Positively tuberculous, 76 cases, or 51 per cent.
2. Doubtful, 31 cases, or 20 per cent.
3. Not tuberculous, 43 cases, or 29 per cent.

The first group included (1) all cases in which there were positive typical signs in the lungs or demonstrable joint or other non-pulmonary lesions elsewhere in the body; and (2) all other cases in which there were suspicious symptoms, such as malnutrition, persistent cough, or inconclusive physical signs in the lungs which reacted positively to tuberculin.

The second group of doubtful cases included cases of (1) all children in whom tuberculin tests were not made, who showed constitutional or pulmonary symptoms, or irregular signs in the lungs, or who showed distinct malnutrition without any other symptoms or physical signs; and (2) those of all apparently healthy children who reacted to tuberculin.

The third group of non-tuberculous cases contained (1) all cases in which tuberculin tests were made and in which there was no reaction; and (2) all cases in which no tuberculin tests were made and in which the children showed no symptoms or physical signs, and were of normal weight for their age.

Next in importance to the frequency of the occurrence of the infection comes the demonstration of the fact that the disease is not suspected by

¹ International Congress, Washington, September 21 to October 12, 1908; Journal American Medical Association, March 27, 1909.

the lay observers, and may not be declared by any signs but those of malnutrition. It is surely time that parents should be reminded of the insidious risks to which these children are exposed.

Miller and Woodruff conclude from systematic observation that:

1. In the children of tuberculous parents, who live in close association with such parents, a large proportion (51 per cent.) become infected with tuberculosis.

2. The earliest manifestations of such tuberculosis are not found in the superficial glands or in the bones and joints, but in the lungs.

3. The physical signs of these early pulmonary lesions in children under ten years of age are very rarely those usually found in adults, but consist more often in the presence of persistent fine rales just without the midclavicular line in the fifth and sixth intercostal spaces. In other cases in which persistent sibilant rales are present in varying portions of the chest, the diagnosis is doubtful, but they should be regarded with suspicion.

The bearing of this statement upon the etiology of tuberculosis is great. It suggests not only that the first avenue of tuberculosis is after all the bronchial tract; its portal, the lung not the intestine; and its vehicle, air not milk—at any rate, in children exposed to infection from their parents. It accords with the higher frequency of certified tuberculosis in the bronchial than in the mesenteric glands, and with the circumstance that the human type of infection is identified in the adult with the pulmonary localization of tuberculosis.

Hitherto the prevailing absence from the lungs of children of typical lesions and of caseous destruction had supported the view that their lungs showed little susceptibility and that their tuberculosis must be usually of the bovine type. Miller and Woodruff's observations seem to disprove both conclusions. They tend to show that the function—shall we say the permeability—of the puerile lymphatics differs so much from that which obtains later that it is possible for the puerile bronchial membrane, like the intestinal, to escape anything worse than a catarrh from the contact of inhaled bacilli; and like it, too, to be permeated by and to transmit the latter to the glands serving the bronchial district.

It is to be hoped that future reports will contain the microscopic evidence which alone can identify the locality of the bacillary activity with the bronchial mucous membrane.

The bearing upon our diagnosis, both clinical and post mortem, is equally great. The absence of the typical physical signs and lesions of adult pulmonary tuberculosis had passed for conclusive evidence of the immunity of the lung in children. But it is enough to remember the peculiarities of the infantile and puerile lungs in their reactions to the pneumococcus and to other infections in order to realize that nothing is more likely than that this peculiarity should also obtain in connection with the tubercle bacillus.

In the work on *Tuberculosis in Infancy and Childhood*,¹ a plan of detecting early infection is ably set forth in an article by Clive Riviere, Leslie Mackenzie, and J. H. Meikle, with special regard to school children in Scotland:

"But the probable prevalence of tuberculosis is not to be decided on such pulmonary acts alone. Vast numbers of enlarged glands were found, some certainly tuberculous. Bronchitis we have already mentioned. Enlarged tonsils and adenoids were numerous. Malnutrition of every grade was common. Thus, many morbid conditions strongly predisposing to tuberculosis were present in a large number of children. All these point to the probable existence of 'latent' tuberculosis—an unfortunate term meaning 'active' tuberculosis, but not as yet to be diagnosed by ordinary clinical methods. (The word 'latent' should be dropped; it is ambiguous.)

"If medical inspection is seriously to affect the prevalence of tuberculosis, the examination of the child must lead back to the examination of his whole environment—food, sleep, cleansing, family history, occupations of parents, health of other members, and, in general, every circumstance that lessens the likeness of the home to a well-conducted sanatorium. If every case of malnutrition is followed back to its home environment, the chances of infection will be diminished, and the medical inspector will know how to estimate the danger.

"It is easy to foresee that special clinical provision must be made for the 'observational' diagnosis of tuberculous cases, and diagnosis must be taken in the wide sense. It implies not merely the recognition of gross disease, which is the climax, but of all the malnutritional conditions that lessen the child's capacity for school work, or diminish its resistance to common ailments.

"Wholesale use of tuberculin is out of the question. Equally so is Calmette's reaction, except under the most stringent hospital conditions. The risk of damage to the eye may not be great; but the risk is positive, not negative. The test would not normally be applied in an out-patient department, and in our opinion it ought not to be applied in schools. This assumes that the test is reliable—a point still unsettled. We think, too, that with more detailed clinical care, more extended scrutiny of glandular conditions, bones, joints, skin, teeth, tonsils, appetite, circulation, disease history, and family history, many marginal cases will come to light. It may be that minute doses of Koch's new tuberculin may become quite safe for diagnosis, but the use of it must be a matter for consultation with the parents. And none of these special methods can be applied profitably except in a regular clinic under skilled supervision."

THE DIAGNOSIS BY THE TUBERCULIN TESTS is advocated by Miller and Woodruff as the most reliable in children. Of these they regard the

¹ Edited by T. N. Kelynaek, London, 1908.

hypodermic test in doses up to 5 mg. as positively diagnostic. Of the local tests, the cutaneous is more reliable in children than the ophthalmic and presents none of its possible dangers. Moreover, it was always corroborated by the hypodermic test, and in consequence they regard it as a reliable and safe means of diagnosis of tuberculosis in children, whereas examination of the sputum, as usually practised, is of almost no aid in the diagnosis of early pulmonary disease.

Their ophthalmic tests were made with a 1 per cent. solution of crude tuberculin in sterile salt solution, as recommended by Baldwin.

For the cutaneous test varying strengths were used, 10 per cent., 25 per cent., and 50 per cent. of crude tuberculin in sterile salt solution, usually one of the two first. In no case in which the 50 per cent. was positive was the 25 per cent. negative.

In the hypodermic method 5 mg. was considered as the maximum diagnostic dose, and in the great majority of cases in which reactions were obtained it was not necessary to go above 1 or 2 mg.

As regards the comparative value of the tests they consider that the cutaneous test is open to none of the objections urged against the ocular. It does not run the risk of the reaction passing unobserved owing to an ephemeral character, as it can be detected in the great majority of cases for at least five to seven days after the inoculation, and in well-marked cases pigmentation and scars remain at the site of the inoculation for a considerably longer period. In a certain number of children a skin reaction occurs without a corresponding eye reaction being obtainable.

Non-tuberculous Apex Catarrh. Wolff-Eisner¹ insists that we possess evidence of the existence of innocent apical catarrhs derived from relatively trivial causes of irritation, such as the inhalation of dust, or from the results of accidental atelectasis induced by nasal obstruction, or by valvular stoppages in the bronchial tubes. Not a few cases of this sort are sent to sanatoria and thereby exposed to infection, to say nothing of the unnecessary expense thrown upon the sickness insurance companies. Yet this might be easily avoided by applying the local tuberculosis reactions, the negative findings of which are conclusive as to the benign character of these catarrhs. He also refers to their value in tuberculophobia, twelve cases of which he was able to relieve of all anxiety.

On the other hand, we are being taught by pathologists that larval and unlocalized tuberculous infections are much more common than had been suspected.

Inflammatory Tuberculosis. Meanwhile, with the dawn of greater hopes of checking tuberculosis, the scope of its operation as a "fons et origo malorum" is recognized to spread beyond the mere production of tubercles or granulations. A. Poncet and R. Leriche² admit an inflam-

¹ Med. Klin., March 24, 1909.

² Revue de Chirurgie, January, 1909.

matory form of tuberculosis, and endeavor to show how keloid, false inflammatory tumors of the stomach, intestine, and breast, and inflammatory infiltrations and scleroses, localized or diffuse, may be the work of toxins generated or left by tubercle bacilli. Rosenberger has identified a bacillemia independent of tuberculous lesions, and Higgs describes a case of tuberculous meningitis in which tubercles were not to be found. These facts fit in also with Hamburger's view that tuberculosis is a children's disease in the common acceptance of the term, and that a child may pass through an attack of tuberculosis just as it gets through its trivial attack of measles.

The Prevention of Tuberculosis. Arthur Newsholme's book¹ contains the latest and most authoritative presentation of the evidence in hand and of the practical conclusions in sight. Of the predisposing influences for the individual, the chief are insufficient light and air. As regards the incidence in communities, the statistics, so liable to mislead, are most carefully scrutinized; and two remarkable facts are demonstrated, both of which are paradoxical. Contrary to our belief in a general improvement of communal health with improving hygienic environment, the incidence of tuberculosis shows no great reduction in communities where disease in general has decreased. In the second place, as regards the liability to the disease among the Irish poor, it is proved beyond question that the death rate among those who have emigrated to the United States stands at a higher level than among those who have remained at home, showing that extreme poverty and squalid surroundings are not the only factors in the production of a high mortality from the disease.

Segregation of the bearers of infection is shown conclusively by statistics to be the most potent factor of sanitary environment; while the evils that may attend the herding together of tuberculous cases in general hospitals are made clearly manifest. Newsholme also brings into relief the remarkable reduction of mortality from tuberculosis which has been brought about as compared with the death rate from other diseases.

Concerning the vehicles of infection, proof is given that neither the quantity of sputum nor the number of bacilli contained are safe guides as to the degree of infectivity. As to the channels, he contends that inhalation, being the most direct, is probably the most frequent avenue of lung infection; but not the only one, as Hugh Walsham has well shown in his study of tuberculosis of bronchial glands. Similarly, intestinal glands may become infected without an intestinal lesion, although ordinary ingestion is undoubtedly the commonest cause.

It is only common sense to neglect no precaution to stop the suspected as well as the recognized vehicles and channels. A study of the con-

¹ Methuen & Co., London, 1908.

flicting views of Koch and von Behring has led him to the conclusion that both human and bovine infection may produce human tuberculosis; both having been identified in man, but the bovine form more frequently in children. As regards the direct infection of children by way of milk, he avers that about 20 per cent. of the milk supplied in large towns contains bacilli. A safe milk supply for infants still remains the great practical desideratum.

Tuberculous Milk. On the much-debated Milk Supply Question we may at least quote some of the practical conclusions of the Royal Commission: "The presence of tubercle bacilli in the milk of cows clinically recognizable as tuberculous confirms the opinion we expressed in our second interim report that the milk of such cows must be considered dangerous for human beings. The experiments which we have carried out with regard to the infectivity of the feces of tuberculous cows were dictated by knowledge of the fact that dirt of various kinds from cows and the cowshed is almost constantly present in milk as it reaches the consumer. Cows suffering from extensive tuberculosis of the lungs must discharge considerable numbers of bacilli from the air passages in the act of coughing, and some of the bacilli thus expelled may find their way into the milk. But our experiments indicate that the excrement of cows obviously suffering from tuberculosis of the lungs or alimentary canal must be regarded as much more dangerous than the matter discharged from the mouth or nostrils. We have found that even in the case of cows with slight tuberculous lesions tubercle bacilli in small numbers are discharged in the feces, while, as regards cows clinically tuberculous, our experiments show that the feces contain large numbers of living and virulent tubercle bacilli. The presence of tuberculous cows, in company with healthy cows in the cowshed, is therefore distinctly dangerous, as some of the tubercle bacilli which escape from their bodies in the excrement are almost certain to find their way into the milk."

The important fact has also been elicited by F. Griffith that a cow's milk and feces may contain bacilli though the udder may be free from lesions.

Bovine or Human Tuberculosis? This is becoming an every-day practical question in therapeutics. E. M. Pottenger,¹ in his paper on the "Intertransmissibility of Bovine and Human Tubercle Bacilli," and the evidence offered by clinical administration of tuberculins made from bacilli of human and bovine origin, indorses the view that the bearers of human bacilli react less violently to bovine than to human bacilli, and also Nathan Raw's conclusion that, by inoculating with bovine tuberculin, immunity to human bacilli may be secured with the advantage of milder reactions.

Inasmuch, however, as both varieties of bacilli are found in the glands

¹ Journal of the American Medical Association, March 27, 1909.

as well as in other organs, we are not warranted in following exclusive rules based upon a priori considerations as to a strict localization of the two types. The action of bovine and human tuberculin differs. So much seems to be known, for it is rare that a patient will do equally well on both varieties; and the best results are obtained when we have at our command remedies made from both kinds of bacilli.

In view of these facts it is clear that differentiation between these two infections in the individual case is an indispensable preliminary to its successful treatment by tuberculin.

F. L. Pochin's¹ investigation on the "Applicability of Opsonic Methods for Comparing Human and Bovine Tuberculosis," was conducted with emulsions of human and bovine tubercle bacilli to determine the relative action of opsonins in bovine blood for tubercle bacilli of human and of bovine strains; and to discover the difference, if any, in the resistance of the animal to infection by bacilli of the different strains. As the number of human bacilli ingested by the bovine leukocytes was considerably greater than the number of bovine bacilli absorbed, the comparative immunity of cows to infection of human origin was explained. Counts made on children gave a converse result. We therefore possess in Wright and Douglas' methods a certain expeditious and inexpensive (though tedious) means of studying the resistance of animals to diseases of human origin, and the resistance of human beings to virulent diseases common to both man and animals.

"DIFFERENTIAL" DIAGNOSIS AND INOCULATION TREATMENT. L. C. Peel Ritchie's² investigation was suggested by the idea that the striking unevenness of the results obtained in surgical tuberculosis by the systematic employment of Koch's tuberculin R. (human) might be due to the bovine derivation of the tuberculosis in some of the cases. After some preliminary experimentation to show that the phagocytic blood reactions of tuberculous individuals might vary essentially in character, Ritchie has satisfied himself that in blood tests by means of phagocytic or of the opsonic index, with bovine and with human tubercle bacilli respectively, the sera of patients react some to one type, some to the other. No case gave positive reactions to both, and no tuberculous case gave a negative reaction to both types. Further, inoculation of tuberculin made from the one type of bacilli affects the phagocytic index of that same type only. This indicates whether the patient is infected with the human or the bovine type. Although we are still far from knowing what significance phagocytosis may really have in the development of immunity to tubercle, this shows the way to the proper form of tuberculin treatment; and this is, "human tuberculin for human tuberculosis," and vice versa. Otherwise real immunization will not be obtained and a relapse will occur. It follows that no

¹ *Lancet*, September 5, 1909.

² *Med. Press and Circular*, March 24, 1909.

phagocytic index test is complete unless both types of bacilli are taken into account.

Thus Ritchie¹ adheres to the doctrine of a differentiation in types of infection, human, bovine, avian, etc., and he contributes a fresh method for differentiation between them as a preliminary to a satisfactory course of specific inoculation treatment. Two other diagnostic tests had previously been available:

1. *The Inoculation Test*, devised by Struthers Stewart,² consists in giving an injection of 0.002 mgrm. of tuberculin for an adult patient. On testing the blood at the time of inoculation, and twenty-four and forty-eight hours after, it is found that a negative phase ensues in an infected person, but not otherwise; that is to say, if a person is infected with bovine tubercle, the inoculation of bovine tuberculin alone produces a negative phase, and that only in the tests with bovine bacilli, and vice versa. A complete test would imply injecting both types of tuberculin and testing the indices to both types of bacilli.

2. *The Absorption Test*³ gives very definite results, and is also specific. It consists in diluting the serum with a thick suspension of an indifferent organism. This absorbs from all sera the non-specific substances which produce phagocytosis while leaving the specific substances, the result of infection, to act on the corresponding bacteria when these are added to the phagocytic mixture. The normal serum used as a control, having no such specific substances, shows a reduced phagocytosis, whereas the infected serum still produces a high degree of phagocytosis of the infecting organism. As I have gone into the details of the test elsewhere, I shall not trouble with them at present.

3. *The Comparative Index Test*, Ritchie's new test, is based on his discovery that, as against the same control, the phagocytic index of an infected person's serum is the same, within the limits of technical error, to all organisms other than the one with which he is infected. The same index to that organism usually stands at a distinctly different level, whether higher or lower. This enables us to test with one indifferent type, such as the avian, with which, for certain, the patient is not infected. This standard index is compared with the indices to organisms suspected as the cause of infection. Thus by testing the patient's indices to avian, bovine, and human tubercle bacilli the index to the avian bacillus gives the standard, and one may expect one of the other indices to correspond. The remaining variable index points to the type of infection.

The necessity of falling back upon the methods of blood examination to determine the appropriate tuberculin treatment arises because the clinical features of the two types are not yet definitely enough ascertained

¹ Med. Press and Circular, March 24, 1909, p. 292.

² Edinburgh Medical Journal, May, 1907.

³ British Medical Journal, November 16, 1907.

to establish a differential diagnosis. Ritchie points out that bone and lung affections represent the bulk of the complications in the human type; and glandular, skin, and eye affections, the chief productions in the bovine type. He is also of impression that the bovine type of surgical tubercle tends to be of a slow, chronic character, often intractably persistent, while the human type is frequently associated with the more acute forms of disease. But this is by no means exclusively the case.

An important etiological suggestion is to the effect that while hospital patients and those of the better classes are almost equally exposed to food infection, those of the better classes are much less frequently exposed to, and also better guarded against, infection from phthisical individuals. The frequency of the human type of infection among hospitals cases may thus be explained.

The Tuberculin Tests. Time is gradually helping to settle the world-wide conflict of opinions (and of results) which has kept the bulk of the profession in anxious expectancy concerning the practical merits of the tests and their relative warrant to be used unhesitatingly for the detection of tuberculosis at the earliest possible stage. As this information is an absolutely necessary preliminary to comprehensive National prevention and suppression of the disease, a debt of gratitude is owing to many who have tried the tests as well as to the honored discoverers of the tests themselves. Space would not admit of a complete review of the long list of these laborious contributions. We must be content, therefore, to submit some of the most recent and representative accounts and statistics from clinical observers so that a general reflection may be obtained of the whole field of study in its present elaboration, with its remaining gaps and its still uncleared obstructions.

The future popularity of the test reactions may be safely predicted. Quite apart from the question as to the alleged frequency of trivial apex catarrhs, which Wolff-Eisner regards as common, the public are likely to become more familiar with the practical significance of the early tests for the presence of tubercle, just as they have been educated up to the value of sputum examinations for bacilli. In a measure as the tests are more widely applied, the laity will insist upon strict evidence of the presence of tubercle before patients are sent to sanatoria, and the demand for the application of the test may eventually originate with them.

The paper by William Engelbach and J. W. Shankland,¹ of St. Louis, "On the Diagnostic Value of the Cutaneous and Conjunctival Tuberculin Reactions," claims attention in view of the strongly adverse conclusions arrived at by the authors from an extensive study of the results, both clinical and experimental, culled from literature and from their own series of observations in adults comprising 499 cutaneous reactions

¹ Journal of the American Medical Association, January 2, 1909.

and 743 conjunctival reactions on 125 positive tuberculous cases, 190 suspected tuberculous cases, 700 other diseases not tuberculous clinically, and 90 clinically normal individuals. The sum total of all the cases considered amounts to 6305, and their adverse opinion is based upon an examination of this material in various tabulated groups. They conclude that "the diagnostic value of these reactions in adults is restricted by many limitations:

"1. The specificity of these reactions has as yet not been demonstrated.

"2. The activity or extent of the lesion bears no definite relation to the degree or kind of reaction.

"3. The conjunctival reaction is not free from danger."

The Dangers of Calmette's Ophthalmo-reaction are pointed out by T. Harrison Butler,¹ who had previously published conclusions that the reaction, though sometimes obtained in the non-tuberculous, and sometimes not obtained in the certainly tuberculous, was a useful aid to diagnosis, and that if the eye used for the test were healthy there was no danger to be feared from a 0.5 or a 1 per cent. solution of tuberculin. Three of the cases quoted have since done so badly that he is now of the opinion that as the reaction is by no means conclusive, it is hardly a justifiable method of diagnosis.

Erlanger, of Berlin, considers that when there is any preëxisting ocular disease whatever, it is most dangerous to use a strong solution until the 1 to 10,000 solution has been tried and has failed.

The observations of Napier show that even when there is no reaction the instillation of tuberculin produces certain changes in the ocular tissues. In two cases in which there was no reaction to Calmette's test, when tuberculin (T. R.) was injected hypodermically ten and twenty-one days later, a local reaction was noticed in the eye which had previously been treated with tuberculin. Harrison Butler instances a case of interstitial keratitis and choroiditis clinically regarded and treated as syphilis and rapidly going from bad to worse; the old tuberculin P. G. gave a typical reaction both general and local. Calmette's reaction would have only decided that the patient was tuberculous; the injection of P. G. gave a clear local reaction, and pointed to the ocular lesion being tuberculous.

According to F. Parkes Weber's² personal experience, the ophthalmo-reaction, in its present form, is of only very limited diagnostic value. The results of the ophthalmo-reaction have been compared with the actual postmortem findings by G. Fehsenfeld.³ On the subject of the

¹ British Medical Journal, August 8, 1908.

² Medical Press and Circular, 1908.

³ Münch. med. Woch., June 30, 1908.

dangers of the ophthalmo-reaction numerous references are supplied by Weber.¹

E. R. Baldwin's² conclusions are not, on the whole, favorable to the employment of the conjunctival test, even when carefully handled and with single instillations of a weak solution. Though it may confirm the presence of tuberculosis in the early stage, it is not decisive where this is only suspected; and we cannot depend upon it for the much desired distinction between "healed" and "active latent" tuberculosis under the appearances of health. Moreover, it is inconclusive. In children there is no call for its use, as the cutaneous method is more free from risks and equally efficient. He has not found the ocular danger such as to deter him from resorting to it when fever or other causes preclude the employment of other tests. The hypodermic test is only required as a last resort, as the cutaneous test with dilute and with strong tuberculin is a safe and effectual means of identifying the presence or the absence of the infection.

Wolff-Eisner's³ advocacy of the conjunctival reaction is summarized in the following conclusions:

1. The subcutaneous and the cutaneous methods are specific reactions for tuberculosis. As they both demonstrate active and latent tuberculosis, their use is extremely limited for clinical diagnosis.

2. The positive conjunctival reaction shows only active tuberculosis.

3. The conjunctival reaction in clinically healthy individuals makes the suspicion that they are affected particularly strong.

4. A negative result in those manifestly tuberculous justifies a bad prognosis.

5. In advancing tuberculous disease negative reactions become more frequent.

6. A positive conjunctival reaction does not justify a good prognosis; but this is the case only in the so-called *Dauer-reaction* (continued reaction), a form of the cutaneous reaction.

7. It is possible to create receptors in tissues that are indifferent as regards life, such as connective tissue, these receptors attracting tuberculin and localizing the toxic action. This observation is of therapeutic value.

The Value and Reliability of Calmette's Ophthalmic Reaction to Tuberculin is advocated by E. Mather Sill,⁴ for the diagnosis of tuberculosis

¹ Kalt, Recueil d'Ophthalmologie, October, 1907; Brunetière, Gazette hebdomadaire des Sciences Méd., December 29, 1907; De Lapersonne, Revue Française de Médecine et de Chirurgie, 1908, No. 2; A. Napier, Glasgow Medical Journal, January, 1908; Ramsa, Lancet, 1908, vol. i, p. 716; Cates, British Medical Journal, 1908, vol. i, p. 989; E. Waldstein, Klin. Monatsblätter für Augenheilkunde, March, 1908; O. Stuelp, ibid. M. Goerlich, Münch. med. Woch., 1908, No. 26; R. Poland, Wiener klin. Woch., 1908, No. 28; Butler, British Medical Journal, 1908, vol. ii, p. 304.

² Journal of the American Medical Association, February 20, 1909.

³ Ibid.

⁴ New York Medical Journal, February 20, 1909.

and differentiation of tuberculous lesions from other diseases in infants and young children on two grounds: (1) The frequency of the tuberculosis being latent or incipient in children, and when manifest, of its being mistaken for other diseases; and (2) the claims of this method to some diagnostic reliability, inasmuch as (a) tuberculosis reacts to the agent; (b) non-tuberculous patients do not show this reaction; and (c) the test has an effect upon old cases of healed tuberculosis, since autopsy records show that many cases of tuberculosis are healed.

A positive reaction was obtained by Sill in all cases of ascertained clinical tuberculosis.

The class of very suspicious cases gave 90 per cent. positive reaction; the less suspicious cases, 18 per cent. only.

In a series of 89 patients with slight ailments and of other diseases none gave a positive reaction.

In cases where no sputum is obtainable or where the lesion is outside the lungs, the test is of value, and it will indicate clinically active or clinically inactive tuberculosis.

While this test is not infallible, and should never take the place of a physical examination, it is often more accurate than the ear or percussion finger in early pulmonary cases; and for demonstrating a negative result is far more satisfactory than a negative sputum examination. The cases reported of permanent injury to the eye or a prolonged inflammation of the conjunctiva have been exceedingly rare, while it has been used with safety in thousands of cases all over the world. We may perhaps set down the few ill results to errors in technique, the test having been used in a diseased eye.

The Diagnostic Value of the Local Tuberculin Tests. A. Erlandsen¹ finds that, to be of service in diagnosis, the tests must be applied in so mild a form as to induce a response only in the active focus (*e. g.*, one drop of a fresh 1 per cent. solution in 0.9 per cent. solution into the eye). If no reaction should occur after three or four days, the other eye (never the same eye) is to get a dose of two drops. The ocular test performed in this way is as reliable as the hypodermic, and can therefore be used to check the results of the cutaneous test. In the latter he scarifies through one drop of the same weak solution, having previously made a control scratch above (which is to be compared with the reaction after twenty-four hours). The surface is to remain exposed for one minute, and then covered with absorbent wool and plaster. Redness and circumscribed infiltration perceptible to the touch indicate a reaction. With those minimal tests his positive reactions have been 100 per cent. in ascertained tuberculosis, 64 per cent. in suspected tuberculosis and 20 per cent. in cases described clinically as free.

¹ Hospitalstid., Copenhagen, August 19 and 26; Journal of the American Medical Association, October 24, 1908.

M. Rothschild,¹ of San Francisco, is in favor of using Moro's ointment in all cases suspected, because it is reliable and free from danger. If negative, the test should be followed in suspicious cases by a tuberculin injection ($\frac{1}{10}$ milligram intravenously or $\frac{1}{3}$ subcutaneously).

An editorial² draws attention to the importance of Moro's³ observations on reactions at a distance from the point of application, in children treated with tuberculin-lanolin inunction, as pointing to a probable participation of the sympathetic nervous system in the reactions. Moro's conclusion is "that the percutaneous tuberculin reaction is essentially a vasomotor phenomenon due to strong excitation of vasodilator paths." He looks on the reaction as an angioneurotic inflammation—a kind of "late reflex" in the sense of Kreibich.⁴

This view contains "the inference that in people infected with tuberculosis there exists a specific irritability of the nervous system toward tuberculin; in other words, a specific nervous 'allergy.'"

The Ear Tuberculin Reaction. The lobule of the ear is found by Tedesche⁵ to be the site of election for a local reaction. He claims for this surface the advantage of being extremely vascular and comparatively transparent. The local reaction is harmless and allows better recognition of the specific induration in the depths of the tissues.

The Opsonic Index in Diagnosis and Prognosis. Wolff-Eisner⁶ expresses the view that as a means of diagnosis and prognosis the opsonic index is not capable of providing us with more reliable indications than the ophthalmo-reaction. His conclusion is based upon his experiments with opsonin coupled with those with complement deflection. As they afford proof that tubercle toxin is absorbed by every bearer of tubercle, and that this practically amounts to so much tuberculin, any artificial introduction or application of tuberculin cannot effect much more than the disease itself would bring about, and any changes induced within the foci might be credited either to the artificial tuberculin or to that produced locally. He ascribes to various tissues a power to produce receptors which will combine the tuberculin and localize its toxic action. This view opens up some practical considerations, as the production of receptors in the connective tissue or in the skin by means of injections or inunctions of tuberculin might conceivably attract away from the lung the tuberculin which had been produced within it.

OPSONIC INDEX DETERMINATIONS SIMPLIFIED. E. F. Campbell⁷ reports a practical method by which the index may be determined in

¹ California State Journal, April, 1909.

² Journal of the American Medical Association, November 7, 1908.

³ Münch. med. Woch., 1908, 2025 to 2028.

⁴ Die Angioneurotische Entzündung, Vienna, 1905.

⁵ Archiv f. Kinderheilkunde, Stuttgart, vol. xlix.

⁶ Münch. med. Woch., November 10, 1908.

⁷ Journal of the American Medical Association, March 27, 1909.

as short a time as an ordinary blood count can be made. He reports as to the most efficient concentration of a sodium citrate and sodium chloride combination, and as to the slight reduction in the amount of phagocytosis caused by the sodium citrate. The method, which seems to be very efficient, is as follows:

A culture of the bacterium to be opsonized is grown on agar agar, blood serum, or some other solid culture media, and after incubation at 37° C. for eighteen to twenty-four hours is washed off with a small amount of sterile 0.85 per cent. sodium chloride and 0.8 per cent. sodium citrate solution.

In place of the regular capillary opsonic pipette, the leukocyte counting pipette of a hemocytometer may be used. The bacterial emulsion is drawn up to the mark 0.5, then on up into the bulb. The blood of the patient whose opsonic index is to be determined is then drawn up to the mark 0.5, then on up into the bulb, where it is thoroughly mixed with the bacterial emulsion. The sodium citrate in the bacterial emulsion precipitates the calcium salts and prevents the coagulation of the blood, which would occur without greater dilution with salt solution.

When the materials have been mixed the solutions are blown into the capillary portion of the pipette and a strong rubber band placed over the ends lengthwise, thus practically sealing it. The pipette is now ready for incubation, which may be accomplished in a regular incubator at 37° C., or if no incubator is available, the pipettes may be incubated in the operator's axilla. The pipettes must be frequently rotated. After incubation for fifteen minutes, or any desired period, the material is blown out on a slide, the smear made and stained with carbothionin blue or some other equally good blood and bacterial stain. The phagocytized bacteria may then be counted, averaged according to the regular methods, compared to a normal slide, and the index thus determined.

J. Arneth's Classification of the Neutrophile Leukocytes and its Application in Pulmonary Tuberculosis. F. G. Griffiths¹ draws a parallel between this too much ignored method and the opsonic.² Its labor is considerable, though not so great as that of the latter; but the labor results in direct and absolute information as to a definite and settled blood feature, not merely a transient and comparative condition. The opsonic index fluctuates so much and so rapidly (as for instance under the influence of food, exercise, or emotion) that it is not possible to ascertain what it is, but only what it was when the observation was begun.

The Agglutinating Power in Tuberculous Patients; Serum Diagnosis and Serum Prognosis. Courmont,³ in his contribution to the Washington International Congress, draws the following conclusions:

¹ Australasian Medical Gazette, September, 1908.

² Zeitsch. f. klin. Med., Berlin, vol. lxvi.

³ Lancet, 1908, vol. ii, p. 1740,

1. The value of the method is great; and the agglutinating power of serous effusions in tuberculosis is a very important point in diagnosis and prognosis.

2. The necessary precautions are of strict and indispensable order.

3. The limitations arise in respect of age and species. Serum reaction is diagnostic only when the degree of agglutination exceeds that of normal individuals of like age and species.

4. Serum diagnosis cannot stand by itself. But where other reasons justify a suspicion, a positive serum reaction has a great value; a negative reaction is of less value. (a) The general reaction (with blood serum) resembles the tuberculin tests in indicating that the system has been or is actually under the influence of tuberculosis, although this may frequently be latent. (b) The local reaction (with serous effusions) is specially useful for the diagnosis of tuberculous pleurisy, and it agrees with the results of cytodiagnosis and inoculations.

5. Serum prognosis of the agglutinating power is proportional to the resisting power of patients, and in inverse ratio to the virulence of infection. Often absent in advanced cases, it has its maximum during the process of healing, and seems to be an index of the protective reaction of the system.

6. The value of its variation for prognosis is shown in tuberculous pleuritic effusion where an increasing agglutinating power carries a good prognosis but absence of reaction has a fatal significance.

The Early Diagnosis of Tuberculosis is, according to A. Calmette,¹ to be found at present only in the local reaction and particularly the ophthalmoreaction (1907), as it is free from danger. Although a negative result cannot exclude tuberculosis, since acute forms and advanced stages fail to yield the reaction, still every person who reacts positively is tuberculous.

Recent reports show that this view of the ophthalmoreaction is not true. It is a method that would best be avoided.

As to von Pirquet's cutaneous test (1907), which acts better in children than in adults, a positive reaction is met with only in 87 per cent. of ascertainably tuberculous children; while it is also positive in 20 per cent. of those children who are presumably non-tuberculous. The drawback to the subcutaneous method is the danger of reviving the activity of healed foci.

Calmette's paper is most valuable as a review of our present diagnostic resources, as the importance of an early diagnosis is becoming every day more apparent. Not a believer either in von Behring's views as to infantile beginnings, or in Koch's views as to the harmlessness of the bovine bacillus, he dwells upon anaphylaxis or the hypersusceptibility

¹ Deutsch. med. Woch., October 1; British Medical Journal Epitome, November 21, 1908.

toward fresh infection of those bearing latent, not healed, lesions. The reinfections increase the resistance, rendering the course more chronic, and are in that sense immunizing, though we are not warranted in speaking of this as an actual immunity either in man or animal.

Various aids to an early diagnosis have been proposed: Pneumography, radioscopy, and radiography only reveal old lesions, while the search for bacilli in the sputum is neither an absolute nor an early test.

The clinical signs, including temperature and pulse, are more useful. Auscultatory asymmetry of inspiration, Grancher's phenomenon, belongs to the earliest stage of pulmonary tuberculosis. The least difference in the vesicular inspiration of the two sides, especially above and immediately below the clavicle, though indicating an alteration on the side in which the sounds are harsher, weaker, or less vesicular, is not absolute that tubercle is its cause. Nevertheless, we must agree with Calmette as to the practical value of this evidence, where every probability favors a positive diagnosis.

Robin and Binet's attempt to prove that raised oxygen consumption and carbonic acid output indicates early tuberculosis has not led to any practical method.

Inconclusive, too, are such observations as Ott's albumosuria, Teissier's pretuberculous albuminuria, and Roger and Josué's blister test. The latter consists in examining the blood for eosinophile cells. In early tuberculosis these cells are said to be absent, and hydropic cells with extremely large nuclei are said to be present in the contents of the vesicle. Again, Jousset's inoscopy and other methods of bacterioscopy for the direct detection of the bacilli in the body fluids have failed to assist the early diagnosis.

There has not been much help either in some other directions: Ehrlich's diazo-reaction is neither constant nor specific; the agglutination test of Arloing, the cytodagnosis of tuberculosis by Widal and Ravaut's method, the complement deviation by Bordet-Gengou's reaction, Wright's opsonic index—all have a technique too complicated and an interpretation too difficult to prove of use for the practical requirements of rapid and safe early diagnosis.

Animal experiments in the large majority of tuberculous cases cannot provide an early diagnosis. When the tuberculosis affects a serous cavity, the fluid may be injected by the Nattan-Larrier's method into guinea-pigs, and reliable results are obtainable within a short time; but the general conclusion is that we must fall back upon the tuberculin reactions.

Simultaneous Staining of Sputum for Cells and for Bacteria. In carrying out his method, which he recommends as valuable, K. E. Eckenstein¹ is careful to avoid crushing the film, which after the usual carbol fuchsin

¹ *Gazette Hebdomadaire des Sciences Médicales de Bordeaux*, February 7, 1909.

staining is decolorized in 20 per cent. sulphuric acid, and washed in 95 per cent. alcohol and in distilled water.

A solution in methyl alcohol of the precipitated stain of Giemsa is then used as a counterstain and the film washed after one or two minutes with distilled water. Lymphocytes, polynuclear leukocytes, epithelial cells, etc., can thus be identified and estimated. The mucus is stained violet, fibrin greenish, and albuminous exudates bluish, while tubercle bacilli are stained red and other organisms blue.

Tubercle Bacilli in the Fasting Stomach. An early diagnosis of tuberculosis has often been achieved by Hausmann,¹ by his routine examination of the fasting stomach contents, in patients applying for other ailments; indeed, in a surprising number of unsuspected subjects.

As a confirmatory test for suspicious sounds at the apex without any expectoration it is invaluable. Hausmann makes the important suggestion that the test should be resorted to not only in all instances of this kind, but systematically in as many individuals as possible in order to detect the so-called latent tubercle infections and to multiply the opportunities for early treatment.

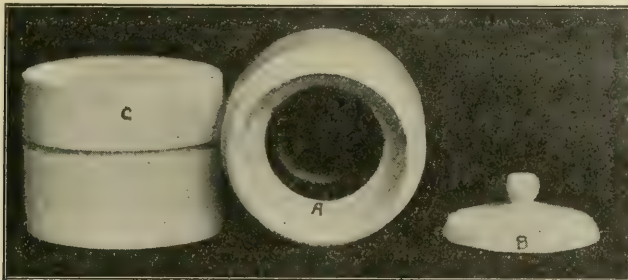


FIG. 1.—A new box for samples of sputum.

A New Sample Sputum Box has been devised by Chase P. Ambler.² It provides admirably for the sanitary safety of all concerned, as well as for the convenience of the microscopist, at a trifling cost.³

The base has an offset or shoulder at *A*, on which the inside cap *B* rests, the interior of the base and the bottom of the cap being covered with asphalt, thus rendering the box impervious to moisture and also making a tight joint at the shoulder *A*. The knob on the top of the cap *B* projects slightly above the level of the base, thus allowing the cap *C* (when the top is screwed down on the box) to press on the knob of the inside cap, making a pressure at the shoulder *A* to insure a perfect joint at this

¹ Deutsche Arch. f. klin. Med., xciv.

² Journal of the American Medical Association, March 27, 1909.

³ Made (in wood) by E. B. Estes & Co., New York City.

point. Ambler has had these boxes in daily use for about a year. The box can always be easily unfastened and the inside cap lifted out without soiling the hands.

The Treatment of Pulmonary Tuberculosis. A sign of the times is the paucity of publications referring to fresh remedies. Some old ones have been lauded again, such as ichthyol by Odell, guaiacol by Jacobi, and sodium cinnamate injections by isolated observers in France and in Germany.

FERRIER'S RECALCIFYING TREATMENT receives a glowing testimonial from Letulle¹ in atonement for his previous criticism and in the light of the improvement he has seen in a large number of dispensary patients now once more able to work. The idea is to lessen acidity, imported or evolved; to supply calcium, and to promote digestive and general hygiene, including labor and sleep according to individual capacity. Medicinally the treatment consists of a glass of alkaline mineral water at rising and half an hour before each meal, and three times daily the following powder:

Calcium carbonate	gr. viiss
Tricalcic phosphate	gr. iij
Calcined magnesia	gr. $\frac{3}{4}$

No wine or spirits; no butter, fat or sauces, lemons, oranges, old cheese, or vinegar are allowed. Not more than 200 or 300 grams of bread and 300 or 400 grams of meat are given. Potatoes, carrots, peas, eggs, fresh fish, and cooked fruits should be the staple of diet. This antacid and alkaline method is in strange contrast with the gospel of overfeeding and raw meat.

Analogous views are set forth by H. Weber.² In contrast with the thickened carbonated blood of arteriosclerotics the blood of consumptives is thin and relatively poor in CO₂. As this defect coincides with a rapid development of bacilli, it is rational to treat those infected with tubercle with an abundant carbohydrate and fatty diet and with stomachics such as creosote (in small doses), which will promote their digestion. He finds an additional argument in the high tuberculosis mortality among diabetics (nearly 50 per cent.); in them sugar is in great part not oxidized, while its sources of supply have to be cut off. The most oxidizable of sugars perhaps is levulose; but as it is rather expensive, Weber substitutes for it pulverized extract of malt. The other great therapeutic indication in phthisis is calcification, which in arteriosclerosis is, on the contrary, the pathological feature. He has, therefore, recently adopted a malt-lime treatment, which he has found most successful so far.

¹ Presse Médicale, March 24, 1909.

² Beiträge z. Kl. d. Tuberculose, x, No. 3.

THE TUBERCULIN TREATMENT. A review of current literature reveals an unmistakable increase in the actual practice of the specific treatment of tuberculosis, and also palpable progress in the growth of our knowledge of the main lines along which it should be conducted. This knowledge is still absolutely rudimentary. But it is something to have arrived at clearer notions as to whether the dose should be small or large; frequent or at long intervals; how to be administered, by mouth, rectum, or under the skin; how to be prepared and of what strength; and, above all, of what generic kind—a human tuberculin or a bovine.

It may perhaps not be too much to hope that next year we may be able to report plausible answers to these questions based upon reliable experimental and clinical evidence, and that a code may have been agreed upon concerning perhaps not all, but at any rate the most vital practical guides for the bacteriotherapeutic management of both surgical and medical cases; and that some light too may have dawned upon the hazy distance of *preventive bacteriotherapy*.

On the subject of the *Administration of Tuberculin in Pulmonary Tuberculosis*, A. Latham and A. C. Inman¹ give the following conclusions:

1. Tuberculin may be given with effect by the mouth or rectum or subcutaneously. The dosage is dissimilar, but animal experiments, opsonic curves, and temperature charts show that the effects produced are the same.

2. The administration of tuberculin meets with little if any success so long as successive auto-inoculations spontaneously occur and cannot be limited by the means at our command. Absolute rest is the most efficient means for limiting auto-inoculation.

3. The administration of tuberculin may be adequately controlled in a large percentage of cases of pulmonary tuberculosis, by a careful daily observation of the temperature and clinical condition of the patient.

4. In cases of difficulty valuable information may often be obtained from an examination of the opsonic index.

5. The German method of the routine administration of tuberculin by gradually increasing doses at stated intervals is not to be recommended. It is only satisfactory in a very limited class of cases, and even then may not lead to the best results.

6. Tuberculin is a dangerous drug and its administration requires considerable experience. It is capable, when given improperly, of producing disastrous and even fatal results.

The practical conclusions arrived at by K. Turban and G. Baer,² in their report of clinical results, are not enthusiastic. They found that when guided by the opsonic index the doses given were necessarily small and less active than when no opsonic index was taken. Again,

¹ Lancet, October 31, 1908.

² Münch. med. Woch., September 22, 1908.

hypersusceptibility is more often produced by Wright's method. On the whole, they believe that the effect of controlling cases which are being treated specifically by examinations of the opsonic index will be to render the doctor overanxious and the patient hypersusceptible.

Calmette's Tuberculin C. L. The remarkable properties claimed for this preparation were brought before the International Congress at Washington by its author. It is a product of the concentration, in vacuo and in the cold, of entire cultures of bovine tubercle bacilli, followed by filtration, by repeated precipitation by alcohol and ether, and by solution in water; salts and peptones are then removed by dialyzation, and after final precipitation of the remaining colloidal substances the substance is dried in vacuo. A dose of 0.0008 gm. of this C. L. tuberculin will suffice to kill a healthy guinea-pig where 0.008 gm. of the alcoholic precipitate of Koch's old tuberculin is needed. Yet 50 cg. of it injected into the jugular vein of a healthy bovine fails to produce the slightest reaction. But if the dose be repeated at intervals of six to ten days, the third injection will be followed by a rise in temperature as though the animal were tuberculous. In reality, however, the result has been to render it singularly resistant to artificial infections, as a massive dose of virulent bovine bacilli, fatal to control animals in the course of four to six weeks, brings about only a slow chronic tuberculosis.

In the human subject it is well borne and of manifest restraining value, though not a "cure." Minute initial doses (one thousandth of a milligram) are gradually increased at intervals of ten to fourteen days, so as to exclude any rise in temperature exceeding half a degree centigrade, and to insure a permanent rise in the opsonic index.

Ritchie's Technique is as follows: Koch's¹ Tuberculin R. is the most suitable and may be obtained commercially, made from either human or bovine types of bacilli, as may be desired. He dilutes the tuberculin with 0.9 per cent. sterilized saline; but glycerin should not be used. This is filled into small sterile flasks fitted with rubber stoppers. A few drops of chloroform are added and renewed as evaporation takes place. The chloroform, on being shaken up, partly passes into solution and serves to maintain the sterility of the fluid indefinitely. The most suitable dilutions depend on the dosage to be given, and for the comfort of the patient it is desirable to inject the smallest quantity of fluid that can be accurately measured in the syringe. The injections should be made with a syringe accurately marked, which can be sterilized by boiling, and is fitted with thin 1 inch platinum needles. As accuracy of dosage is of such importance, it is desirable to use a syringe marked in divisions of 1 c.c. The injection should be made directly into the substance of a muscle; the middle of the triceps in its lower fourth, or in children the gluteus, is the most convenient.

¹ Loc. cit.

In the treatment of chronic glandular tuberculosis in the adult Ritchie recommends a dose of 0.001 mg. of the appropriate tuberculin; repeated in two weeks, then in three weeks, and then at successive intervals of four weeks. After at least six months, if the case has progressed satisfactorily, the interval might be extended to five or six weeks and the dose increased by a quarter or a half to 0.00125 or 0.0015 mg., and continued to the end of treatment.

As regards operation, as tuberculin treatment has little effect on caseous deposits of tubercle, and therefore chiefly guards against extension, he inclines to recommend that, unless abscess formation already exists, operative procedures should be deferred until a course of tuberculin treatment has been conducted for six months, when a radical removal may no longer be called for and recovery may be secured by persevering with the inoculations.

Möller's¹ *Treatment by Allied and Combined Tuberculins* was suggested to him by the unjustified prevalence of a dread of the tuberculin syringe. He first tried inhalations, which are incapable of an exact dosage; and then nasal applications of tuberculin, which do not equal the subcutaneous injection in sharpness. Tuberculin suppositories or enemas will produce reactions; tuberculin by the stomach takes a specific effect as proved in animals. But in man the full effect is best obtained from the gelodurat capsule, which is not attacked in the stomach, and from which the tuberculin is set free only after it has passed into the bowel. The gelodurat capsules are made of the wall of the small intestine. When given in this way tuberculin exercises the same action as when applied subcutaneously. The hypersusceptibility which at times sets in with ordinary tuberculin and with the bacillary emulsion, can to a certain extent be diminished or prevented by combining the emulsion of other acid-fast bacilli nearly related to tubercle bacilli (for example, timothy bacilli, blind-worm bacilli); and the author has shown that the specific process is equally manifested by the "tuberculinoids" (that is, the emulsions of the other acid-fast bacilli), as by the true bacillus of Koch. The dose of the allied tuberculins, however, has to be higher than that of the real tuberculin. He has also combined calcium formate in a "tuberoid" gelodurat capsule with 0.001 mg. of tubercle bacilli in emulsion, 0.0001 c.c. of emulsion of thimothein and 0.01 gram of formate of calcium. One capsule every second day, and after two or three weeks every day, is useful in children with tuberculous glands. Febrile patients often lose their fever; there is a disappearance of night sweats, a diminution of the cough, and an easing of expectoration. Purulent sputum becomes serous, and the appetite improves.

Edwin Klebs² recommends the use of *Tubercle Sozine*, or, when this fails, the injection of Möller's blind-worm tuberculin. He is in

¹ Münch. med. Woch., November 10, 1908.

² Berl. klin. Woch., August 17, 1908.

favor of an extended use of the latter in the early tuberculosis or scrofulosis of children.

THE CHOLESTERIN TREATMENT of Lemaine and Gérard,¹ based upon the fact that Phisalix, in 1897, observed the antitoxic action exerted by the bile and the bile acids, and especially by cholesterolin, in the presence of the venom of vipers, has not been reported on, although some good results had been observed clinically in advanced cases. Experimentally the results obtained in monkeys has not been striking.

PULMONARY COMPRESSION METHODS. H. Pigger² gives notes of five cases of artificial nitrogen pneumothorax which showed at first increased absorption from the foci, but subsequently a reduction, with the effect that the positive opsonic phase became permanent. He is led to suggest that this method should not be limited to the severe, but extended also to some of the milder unilateral cases.

O. Bruns³ experimental researches, from Brauer's clinic at Marburg, have established the fact that the beneficial effects include the healing of tubercle by fibrosis and encapsulation. The disablement of one lung occasions, like any other form of pulmonary diminution, increased labor and hypertrophy of the right side of the heart.

L. Brauer, under the general heading of "Lung Collapse Therapy," describes a new extensive extrapleural thoracoplastic operation for curative collapse of the lung, which involves the resection of several ribs, and which he regards as of promise in suitable cases.

ARTIFICIAL PNEUMOTHORAX. After an experience of eleven cases in the advanced stage (in addition to thirteen cases referred to by Saugman), Thue⁴ recommends the operation even in some of the earlier cases. In a spontaneous case the patient had survived twelve years, doing hard manual labor, and after his death (from sudden hemorrhage) the left lung was quite healed, but still compressed by a pneumothorax.

The three cases of artificial pneumothorax reported by F. Graetz also showed at the autopsy undoubted proof of the local progress of healing in the region under compression, and they afforded no obvious evidence of any transmission of the materies morbi, which is, of course, likely to be squeezed into the lymphatic channels if any should be patent.

Schmidt's experience with artificial pneumothorax, which has included 13 cases of tuberculosis, 8 cases of bronchiectasis, and 3 cases of aspiration disease, pneumonia, or fetid bronchitis, has not been overbrilliant, and leads him to conclude that the genuine benefits of the operation are confined to a limited number of cases. It is estimated that in not less

¹ Nord. Méd., November 1, 1907.

² Beiträge z. Klinik der Tuberculose, viii, No. 4.

³ Ibid., xii, No. 1 (with bibliography).

⁴ Norsk. Mag. f. Lægev., December, 1908; Journal American Medical Association, February 13, 1909.

than 22.7 per cent. of the cases reported in Germany, the establishment of a complete pneumothorax was rendered impossible by preëxisting adhesions.

THE "BIER METHOD"—or, more correctly, as contended by Foustanos,¹ "the Hippocratic method, according to Bier"—is applicable to phthisis in two forms: (1) By means of Kuhn's lung suction mask, and (2) by Tucker-Wise's postural method.

L. Brown² is so much impressed with the value of the hyperemia treatment in surgical tuberculosis that he urges that in all country sanatoria for consumptives, a male and a female ward be set apart for surgical cases, to be under the care of an assistant conversant with Bier's hyperemic treatment.

1. *Kuhn's Mask.* L. Melchior³ has tried the mask in eleven cases, but only one of them seemed to be benefited, and that was a patient in the first stage. The others were more advanced. G. Morelli's⁴ observations were made not in phthisis but in heart disease, and his more favorable conclusions are readily explained in connection with the pulmonary soundness presented by his material.

2. *Tucker Wise's Inclined Prone Couch* is reported by him to have been very satisfactory in all the cases in which he has tried it. It will be remembered from the description of it in PROGRESSIVE MEDICINE, September, 1908, that the method combines mechanical, bronchial, and respiratory advantages, with the vascular. Passive hyperemia of the apex is only one of the beneficial agencies secured; and it is therefore difficult to assess the precise share which belongs to it in the main result which is achieved.

THE ACTION OF DIFFUSED LIGHT UPON THE BACILLUS TUBERCULOSIS. Weinzirl states that the *Bacillus tuberculosis* was killed in from two to ten minutes by exposure to direct sunlight. When exposed to diffused light, it was always killed within a week, and in some cases within twenty-four hours. When the bacilli were dried and exposed to diffused light, they lived longer than moist cultures. It appeared certain that diffused light materially shortened the life of the bacillus.

LIGHT TREATMENT FOR TUBERCULOSIS, as applied at Boulder Lodge Sanatorium, Fort Dodge, is favorably reported upon by J. W. Kime.⁵ He had previously proved in 1903 that the actinic rays will travel through the tissue of the body.

The mode of using the light for the exposed chest after cooling the rays through the blue tank is shown in Fig. 2. The rays penetrate the entire thickness of the thorax, having a retarding influence upon the

¹ Grèce Médicale, November, 1908.

² American Journal of the Medical Sciences, February, 1909.

³ Hospitalstid., Copenhagen, January 27; Journal American Medical Association.

⁴ Zeitsch. f. klin Med., lxxvii, Nos. 1 to 3.

⁵ New York Medical Journal, July 4, 1908.

growth of bacteria and engorging the parts with blood. The light is used for twenty minutes each day. The results since instituting the light treatment have been so much better than before, that there is no

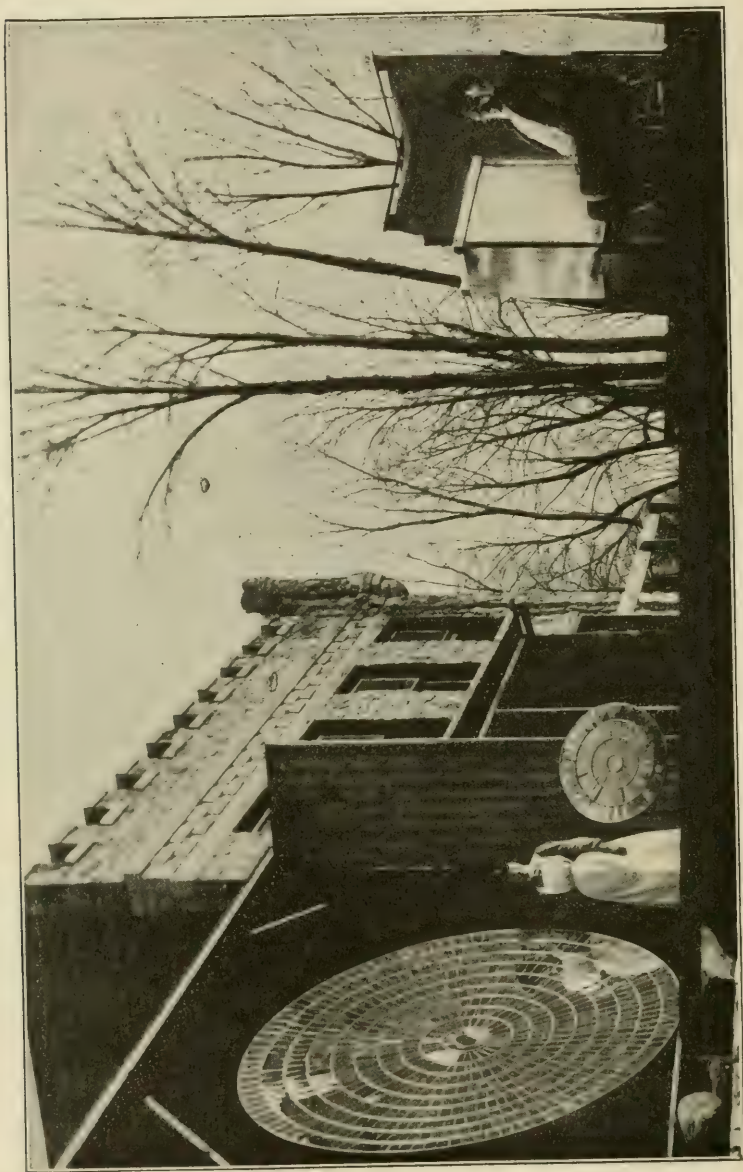


FIG. 2.—Manner of using sunlight.

room for doubt as to the beneficial effect of these rays, which are, however, in the far advanced cases of but little value. In early cases more rapid improvement is noted than prior to the use of the light; and the

psychic effect of the light is an adjuvant such that he would under no circumstances part with its help.

SUNSHINE IN THE TREATMENT OF SURGICAL TUBERCULOSIS. A valuable notice has appeared of Oscar Bernhard's¹ recently published experience of many years on the therapeutic influence of sunlight in the treatment of simple and infected wounds and ulcers, of tuberculosis of the skin, glands, joints, and bones, of cancer of the skin, and of deep-seated syphilitic ulcerations, at St. Moritz in the Engadine. The high altitude (1800 meters, or 6000 feet) increases the effect of the sunlight; the dryness of the air must also tell. The hyperemia produced by the rays of the sun doubtless assists the healing. The bactericidal effects of sunshine were proved by Downes and Blunt² as far back as 1877. Bernhard employs, in the treatment of fistulas, pliable metallic funnels of different sizes and depth. He refers to the good results which Rollier³ has obtained by heliotherapy.

Rollier reports about 110 cases of surgical tuberculosis treated since 1903 in his clinique at Leysin, above Aigle in the canton of Valais, on the lines developed by Bernhard. Operative interference was reduced to a minimum and the results obtained were most gratifying. Rollier publishes ten new cases of complex tuberculous disease of joints and bones treated with remarkable success.

SANATORIA. Ocean sanatoria have again come up for discussion.⁴ With regard to the proposal to fit out a sailing vessel of 2000 tons to cruise in the vicinity of the Canaries, Arthur E. T. Longhurst⁵ points out that fine weather is not to be had to order. Again, in the monotony of a calm there is often oppressive heat, stagnation of the air, and bad smells from the bilge water and sewage offal floating round the ship's sides.

In steamers, on the other hand, there must be taken into account the vibration, the noise of the engines, the smoke, steam, smell of oil, etc. These are, he thinks, less objectionable than the stagnation and imperfect ventilation of sailing vessels. Should the ultimate decision of the promoters be in favor of sailing vessels, auxiliary steam power should be provided to work when necessary the screw or paddle, preferably the latter.

There is, also, the difficulty of providing suitable exercise, which is regarded by Chittenden Brown⁶ as the all-important feature of the treatment as carried out at sanatoria on the Nordrach system, with such marked success. How can this be done on board a ship?

¹ *Lancet*, December 12, 1908.

² *Proceedings of the Royal Society of London*.

³ *Revue Médicale de la Suisse Romande*, September 20, 1907.

⁴ *British Medical Journal*, November 21, 1908.

⁵ *Ibid.*, November 28, 1908.

⁶ *Ibid.*, December 12, 1908.

GRADUATED REST IN PULMONARY TUBERCULOSIS. The importance of Edward E. Prest's communication lies in the emphasis he places upon protection from the causes of cough even in preference to the vaunted open air. The only way that a non-irritating climate can be produced in England, on certain winter days, is by means of a fire, which does not unduly dry the air, and, if necessary, by preventing too large an entrance of the outside atmosphere. The sending of phthisical patients abroad should never be encouraged without very careful consideration. Rest at home should be the rule, for if rest of a graduated kind together with good food are the chief means we possess for bringing about a cure, the precise climate in which a sanatorium is erected will, according to Prest, be a matter of comparative unimportance.

ALPINE CLIMATES IN TUBERCULOSIS. I have endeavored to establish the two following propositions regarding the treatment of early cases of pulmonary tuberculosis in England: (1) The best possible results in early tuberculosis will be obtained from the home sanatorium treatment after the patients shall have had the advantage of a preliminary course at the Alps; (2) at Davos, the best results are obtained when the patients resort to it at their earliest stage, before any time has been spent over any other form of treatment, whether at their homes or at any home sanatorium in England. These two propositions make for one practical conclusion, namely, that the true policy is one of systematic combination for individual cases of the Alpine and of the Home Sanatorium treatment.

RESPIRATORY GASES AND AËROTHERAPEUTICS.

The Composition of Alveolar Air. J. S. Haldane's investigation,¹ which has revolutionized our theories of respiration, begins with a study of the composition of the air of the alveolus. His method for obtaining alveolar air for examination is exceedingly simple. Alveolar air can be obtained by taking a sample of the last part of the air expired suddenly, through a piece of wide-bored tubing, the subject of the experiment having been breathing quite normally until the sample is taken. It is found that the percentage of CO₂ in the sample is about 5.6 on an average for men.

With increased barometric pressure the alveolar CO₂ percentage falls in inverse proportion to the rise of pressure, so that the partial pressure of CO₂ remains constant in the alveolar air. After forced breathing apnea is produced (using the word in its true and physiological sense, "cessation of breathing").

¹ British Medical Journal, January 16, 1909.

² Ibid., 1908, vol. ii, pp. 331 and 1434.

The Causation and Phenomena of Apnea. Whilst the percentage of CO_2 in the alveolar air is remarkably constant for the individual—varying from about 5 to 6 per cent.—a diminution of 0.2 per cent. suffices to produce a state of apnea; that is, the stimulus of CO_2 to the respiratory centre has become insufficient. Therefore, apnea is not a question of oxygen, and the old theory of the summation of stimuli to the vagus, causing inhibition, must be abandoned. The state of apnea is due to the removal of CO_2 from the alveolar air, and it is possible to bring this about at will. By the method of forced breathing the lungs are ventilated, the venous blood flushing out the CO_2 from the alveolar air. More O_2 is taken up, but the hemoglobin is already saturated. Want of O_2 is in reality only a feeble stimulus to the respiratory centre, as evidenced by the phenomena of CO_2 poisoning, and by the fact that death from want of O_2 while ballooning at high altitudes may take place without any previous panting or respiratory distress.

The Influence of Lactic Acid. Haldane lays great stress upon the respiratory effect of the production of lactic acid during bodily exertion, rendering the blood less alkaline. This acts as a stimulant of the respiratory centre. In proportion to its presence in the blood it takes less CO_2 to stimulate the centre. The conclusion arrived at is that the removal of a sufficiency of CO_2 is the cause of the condition of apnea.

Demonstrated in his own person, the effect of four minutes of forced respiration, while sitting in a chair, was a period of complete apnea, lasting for three minutes. During this time his face became somewhat gray and pallid, with a slight degree of lividity of the ears and finger nails. Then respiration recommenced, and a slight flushing of the face took place. Haldane states that sometimes the recommencing respiration was of the Cheyne-Stokes character, and his tracings showed this.

Acapnia and Shock. Y. Henderson's¹ latest investigations tend to show that acapnia—a lowered blood content of CO_2 —is partly responsible for surgical shock in laparotomy, and that while the acapnia, which is due to hyperpnea, by irritation of sensitive nerves plays an important part in the central inhibition of peristalsis, local acapnia, due to direct exhalation of CO_2 from the exposed visceral surfaces, is a factor in the loss of tonus in the exposed viscera. He finds that the minimum rate of exhalation of carbon dioxide from exposed peritoneal surfaces is from 0.15 to 0.2 c.c. per sq. cm. in the first half hour, or forty times the rate from the skin. Exposing, at body temperature, the abdominal viscera to a current of air saturated with moisture rapidly induces congestion and loss of tonus and motility.

The inferences from these observations in their bearing upon the physiology of respiration are of primary importance. They point to

¹ American Journal of Physiology, Boston, April, 1909.

the stimulating function of CO_2 in the blood not being limited to its operation on the respiratory centre itself, but exerted widely throughout the body on nerve and muscle tissue, and that " CO_2 tension is a factor in the maintenance of tonus (in the broad sense of the word) of the same order of importance as temperature, oxygen supply, osmotic pressure, and the equilibrium of anions and kations."

As a practical conclusion, the maintenance or restoration of the normal CO_2 tension should be a preventive and a remedy, and this is corroborated by the results observed.

The therapeutic inhalations of CO_2 which have proved beneficial in certain clinical conditions may possibly have possessed a much wider range of usefulness than the cardiorespiratory improvement recorded.

The Nature of Mountain Sickness is a question in which all phthisiologists are interested, and for them it offers greater practical importance in connection with the growing popularity of the altitude cure than the opposite condition of "compressed air" or "caisson" disease, which comes under the notice of but few observers. Familiarity with the latest theories is, in another direction also, of practical interest to the physician, inasmuch as they are apt to be freely discussed and thought out by the patients at altitude resorts. This implies a thorough grasp of a few physiological data of primary importance which are not special to this affection, but are inseparable from the clinical pathology of the entire group of respiratory diseases.

J. S. Haldane's¹ article appeals in this respect to the profession, although written in the simpler and lighter vein which is suited to the lay reader. He is able to prove conclusively that the symptoms of mountain sickness, just like the almost identical symptoms of carbon monoxide poisoning, are due to lack of oxygen, not to acapnia or lack of CO_2 as held by Mosso. The symptoms in question are shortness of breath on exertion, nausea and vomiting, headache, various mental disturbances, and in severe cases complete failure of power over the limbs and loss of the senses. The mental effects which are especially evident in partial carbon monoxide poisoning resemble greatly alcoholic poisoning.

The highest ascents without any artificial inhaling of oxygen were 29,000 feet by Glaisher and Coxwell in 1862, and 28,200 feet by Tissandier, Croce-Spinelli, and Sivel in 1875, when Tissandier alone survived.

The highest peaks reached as yet by mountaineers are about 24,000 feet. Dr. T. G. Longstaff, speaking with considerable Himalayan experience, gives it as his opinion that ordinary physical training is more important than previous acclimatization, and may yet enable men to reach, without artificial aid from pure oxygen, the highest peak of the Himalayas, higher than the level which proved fatal to the French *aéronauts*.

¹ Quarterly Journal, January, 1909.

The Hygiene of Work in Compressed Air has been fully described by John Scott Haldane¹ before the Society of Arts. *Diver's palsy*, usually an evanescent symptom, but sometimes a permanent, lingering, and fatal affection was described by Paul Bert, thirty years ago, and has since been studied by many investigators (von Schrötter, Leonard Hill, and others).

It is not produced by pressures less than 2.6 atmospheres of absolute pressure, *i. e.*, 23 pounds per square inch added to the ordinary atmospheric pressure, or a depth of 53 feet in sea water. It is due to the blood becoming saturated with atmospheric air at the increased pressure. The excess of oxygen disappears altogether into chemical combination with the tissues, while the nitrogen is removed by simple absorption into the tissues, very little of that gas returning to the lungs. Nitrogen being about six times as soluble in the fat of the body as in the blood, fat acts as its reservoir. This nitrogen, on the reduction of the pressure, reappears in the gaseous forms in the capillaries and interstices of the tissues and brings about the various symptoms of pain, palsy, etc., to which the name of *caisson disease* has been given. In a frog, bubbles of gas can be seen in the web under the microscope, and are absorbed again when the pressure is renewed. A great number of experiments have been made with Ludwig Mond's steel compression chamber at the Lister Institute, with very small animals, such as mice; no ill-effects are produced in circumstances of compression and decompression which would kill a goat.

In caissons, the men remain for the required time in an air-lock in which the pressure is progressively increased or reduced, according as they are passing in or out. When the air is at a pressure of only two atmospheres, even very rapid decompression fails to produce any ill effect.

The various systems of decompression may be classified as either "stage decompression" or "uniform decompression," the former being much the better of the two. There is an important distinction between absolute and relative decompression. For instance, a rapid drop of 50 pounds of pressure from 90 pounds to 40 pounds is of little consequence, but a rapid drop of 50 pounds from 65 pounds absolute pressure to that of the open air would be fatal. With divers the old plan was to lower them down slowly and pull them up slowly, but recent investigations showed that if they were working at a greater depth than 50 feet it was better to pull them up quickly to 50 feet where they remained for three minutes; after this they were pulled up 10 feet at a time with an interval of three minutes between the ascents. Pearl divers and sponge divers went down quickly to great depths and rose again with equal quickness; they did not suffer in consequence of this, because their stay under water was too short for any considerable absorption of nitrogen by the tissues.

¹ Lancet, December 14, 1907.

Dyspnea, Hyperpnea, and the Influence of Want of Oxygen. "With a deficiency of from 5.5 to 8 per cent. the hyperpnea begins to be distinctly appreciable in man; it is extreme with a deficiency of 15 per cent. The alveolar CO_2 percentage falls markedly, and the hyperpnea is accompanied by cyanosis and confusion of mind. Symptoms due to want of oxygen are also produced by lowering the barometric pressure and thus diminishing the partial pressure of oxygen in the air breathed.

"*With Diminishing Barometric Pressures* the alveolar CO_2 pressure kept steady until the atmospheric pressure was diminished by about a third. In other words, the alveolar CO_2 percentage increased in inverse proportion to the fall in atmospheric pressure, and the volume of air breathed remained steady. Meanwhile the alveolar oxygen pressure had, of course, greatly diminished. With a further fall of atmospheric pressure the alveolar CO_2 pressure became distinctly diminished, cyanosis became evident, and the subjective symptoms became so marked that the observations could not be carried on when the pressure fell to a little less than half an atmosphere, although the hyperpnea was only slight. These experiments were made in the steel chamber at the Lister Institute, and were of comparatively short duration. It was noticed that sometimes the alveolar CO_2 pressure did not return to normal at once on raising the pressure to normal. After a twenty-four hours' experiment the alveolar CO_2 took two days to return to its old level.

"At normal atmospheric pressure the extreme hyperpnea seen during short exposures to low percentages of oxygen depends upon the large amounts of preformed CO_2 which are washed out into the lung air in such experiments. If this preformed CO_2 is got rid of gradually—as, for instance, was the case in the steel chamber—the hyperpnea is much less marked, and the alveolar oxygen consequently falls more, so that cyanosis and subjective symptoms become prominent with a much less low partial pressure of oxygen in the inspired air. If the excess of preformed CO_2 is first got rid of by forced breathing for about two to five minutes, the consequent prolonged apnea lasts until the subject becomes extremely cyanosed and confused. There is simply no desire to breathe, in spite of great signs of lack of oxygen. When the desire to breathe again returns, the alveolar CO_2 percentage is still below normal, unless the cyanosis, etc., have been prevented by inhaling oxygen at the end of the forced breathing. It seems that the hyperpnea produced by lack of oxygen has little or no direct effect on the respiratory centre, but that it leads to the formation of some substance which reinforces the action of CO_2 . This substance is very probably lactic acid or some other organic acid, and the respiratory centre seems to react to the total acidity, due partly to free CO_2 and partly to lactic acid, etc. The rapid reaction of the respiratory centre to lack of oxygen is probably due to development of lactic acid in the centre itself, and this would also explain the rapid recovery after short exposures. The more gradual effect seen on going to high

altitudes, or remaining for sometime in the steel chamber, is probably due to gradual saturation of the blood and tissues with lactic acid from parts of the body where the circulation is much less perfect than in the respiratory centre," etc.

The Production of Dyspnea in Pathological Conditions. "The great distress caused by any mechanical hindrance (asthma, etc.) to breathing is really intelligible considering the extreme sensitiveness of the respiratory centre to the slightest increase in the alveolar CO_2 pressure. The effect of any condition, such as exudation or inflammatory alterations, tending to hinder the gaseous exchange between the blood and alveolar air, is less easy to predict. Although oxygen is more diffusible than CO_2 , yet CO_2 is much more soluble in the semiliquid exudation, so that the entrance of oxygen may be more hindered than escape of CO_2 . We have also to consider the probable abolition of the active part played by the alveolar epithelium in the exchange, as demonstrated by the experiments of Bohr and of Lorrain Smith and Haldane. That such an abolition occurs is indicated by the experiments of Lorrain Smith on the great fall of oxygen tension in the arterial blood in the pneumonic condition which is produced by breathing oxygen at high pressure. There may, therefore, be cyanosis in pneumonia, etc., and this may possibly be accompanied by no increase, or even diminution, in the partial pressure of CO_2 in the arterial blood.

"Another class of cases are those in which the circulation is from any cause impeded. Here the aëration of the blood may be perfect, but the tissue aëration imperfect, on account of deficient circulation, particularly on any exertion. The excess of CO_2 thus produced can be compensated for by increased depth of breathing and consequent reduced partial pressure of CO_2 in the arterial blood; but increased depth of breathing will not appreciably increase the oxygen in the arterial blood, so that a serious abnormal condition remains. The inability of the heart to respond to increased demands during muscular work must also be considered.

"Another important group of cases are those in which the oxygen-carrying power of the blood is greatly diminished by the hemoglobin being diminished in concentration or thrown out of action, as in 'anemia,' or poisoning by such substances as CO, nitrites, dinitrobenzol," etc.

Valuable data are also contained in a preliminary communication by Beddard and Pembrey¹ on the *pulmonary ventilation in disease* in the pathological states of capillary bronchitis, failure of the right side of the heart, pernicious anemia, pneumonia, diabetic coma, and Cheyne-Stokes respiration.

The Therapeutic Value of Carbon Dioxide Inhalation. Leonard Hill has rendered a distinct service to respiratory therapeutics in pointing

¹ British Medical Journal, 1908, vol. ii, p. 580.

out the practical uses of CO_2 inhalation as a means to respiratory expansion where, as after chronic compression by an empyema, the lung and the chest wall have become inactive and collapsed.

It is well that physiologists should be turning their attention to the clinical management of CO_2 inhalation, a great deal of which has been going on unsuspected and without any attempt at regulation.

The remarkable physiological properties of the gas and its presence in our atmosphere give it a place second only to oxygen among our primary and elemental therapeutic agents, and an interest which is not purely ephemeral. Its directive power over the respiratory function is indeed superior to that of oxygen. When I was asked the reason for my administering it in some cases of dyspnea, the paradoxical reply, "I give CO_2 to provide the supply of oxygen which is needed," was a plain statement of fact. The thorax expansion, to which Leonard Hill and Martin Flack draw special attention, is among the most striking of its respiratory uses; and for the kind of cases in point their simple device for keeping the percentage inhaled roughly below 3 per cent. may be safe enough.

But there are more vitally important respiratory uses than this, as, for instance, in asthma, needing very careful handling. Moreover, outside the respiratory function, the cardiovascular, the nervous, and the muscular system are all capable of being influenced for better or for worse. I have obtained striking results from the CO_2 inhalation in painful affections, and particularly in severe cramp of the abdominal muscles. Although I¹ have only published observations in cardiac disease in my paper, "On the Prebalnear Treatment of Heart Disease by Inhalations of Carbonic Acid Gas, and on the Uses of the Inhalation in Cardiac Dyspnea and in Anginoid Pain," a somewhat extensive clinical investigation had convinced me that the range of clinical usefulness of the inhalation was considerable.

My method was to deliver the gas from a cylinder through a wash-bottle, and to regulate the rate of bubbling by watching the effect upon the patient. Personal supervision by the physician is, I think, essential when this treatment is used for cardiac dyspnea, anginoid pain, and various spasmodic affections. In none of them would it be advisable to delegate the use of so potent a therapeutic toy as the open respirator tube described by Leonard Hill, although that potency can be attenuated by reducing the tube length. If our physiologists would provide us with some simple and reliable method for the supply of a percentage mixture of say 1 to 1.25 CO_2 in air, we should be endowed with a safe and in my experience a most valuable remedy for a large set of clinical conditions.

¹ British Medical Journal. 1899, vol. ii, p. 178.

Oxygen and Muscular Exercise as a Form of Treatment. Leonard Hill and Martin Flack¹ derive from their physiological study of the effects of the timely inhalation of oxygen during exertion the practical suggestion that it might with advantage be utilized clinically. For athletes its great use is the relief of fatigue, which is more marked than its prevention. This was demonstrated in Wolffe's Channel swim when his exhaustion was relieved by resorting to the inhalation. For the convenience of athletes and others Hill has constructed a simple apparatus, a combined generator and inhaler as easily worked as a soda water gasogen. Inasmuch as oxygen increases metabolism it might be of great use to the fat and overfed and in the graduated exercise treatment of emphysema and heart affections.

The Uses of Oxygen in Sport. In extenuation of his ignorance that Jennings had written a paper on "Oxygen in Sport" in a weekly Parisian medical paper, Leonard Hill mentions that the fact that oxygen helps an athlete to run, especially when not in perfect training, was found out by W. G. George twenty-five years ago; so there is no priority to be claimed more recently.

Greater interest centres round the explanation of the physiological facts. Oscar Jennings claims the priority of having discovered that oxygen inhalation restores the blood pressure when lowered by forced exercise, and bases his claim upon sphygmographic tracings. But Hill reasserts that the sphygmograph is not an instrument by which blood-pressure can be measured; that it is difficult to apply it twice without modifying the form of the tracings obtained, especially by the old method of band fixation; and that he himself has by this means hitherto been unable to obtain trustworthy evidence as to the effect of oxygen.

The contention that he had ascertained Jennings' demonstration "that oxygen in restoring wind did so by restoring the adequacy of the lung" is not conceded, as Leonard Hill claims that this is the very thing which he has not ascertained. The inhalation of oxygen after forced exercise has no effect on the breathing volume or the breathing frequency, as is shown by the figures obtained by Martin Flack and published in the *Journal of Physiology*. It is the carbonic acid produced in the body which regulates the breathing frequency and the volume. Oxygen acts on the heart, and restores the blood pressure, lowers the pulse rate, and increases the neuromuscular power of the man; it does not act in restoring wind by restoring the adequacy of the lung.

His own claim is that the experiments undertaken with Martin Flack were not simply directed toward "doping" in sport; and that they have ascertained that oxygen and exercise can be used as a valuable method of treatment. His present declared object is to work out the exact extent to which oxygen inhalation influences the metabolism of the "working" man.

¹ British Medical Journal, October 3, 1908.

PHYSICAL SIGNS AND EXAMINATION OF THE CHEST.

"Algeoscopy" is the name assigned by K. Francke¹ to the determination of the special spots of thoracic tenderness (probably of pleuritic origin) which he finds exceedingly prevalent in sufferers from phthisis (77.9 per cent. in a series of 200 subjects). It is easy to follow up these local areas of tenderness by painting the spots with iodine. Of course, common muscular tenderness must be carefully eliminated. As 125 out of 154 incipient cases presented this peculiarity, it is one he thinks well worth turning to account in diagnosis.

The **"Distant Cough and Voice Sign"** was described by Martin du Magny² before the Académie de Médecine, as characteristic and distinctive, even quite early, of compression of the bronchial tubes. It is elicited in the sitting posture by alternate auscultation of the apex and of the base while the patient is repeating or shouting "333." At the apex the cough or voice are "into the ear." At the base they seem to come from afar; and the impression of distance is in proportion to the compression.

The Nipple as a Landmark in the Male. Even in the male the nipple is not a thoroughly reliable landmark. This was established by Sabrazès and Lafforgue's³ observations, which showed that in right-handed heavy manual laborers the distance from nipple to umbilicus is apt to be greater on the left side than on the right, presumably owing to some influence of the greater development of the upper thoracic musculature and the associated spinal peculiarities. Gorski⁴ has recently formed the same general conclusion from an examination of 300 well-grown young soldiers.

The Aeration of the Apex of the Lung by the Action of the Diaphragm. In a paper on the "Mechanism of Respiration in Health and Disease," Arthur Keith⁵ emphasized that a proper action of the diaphragm—above any of the other parts concerned in the mechanism of respiration—is essential for the proper expansion of the apex of the lung; the conical shape of the thorax insures that a descent of the lung must be accompanied by an expansion of the apex in every direction. However strong the action of the upper ribs may be, they cannot influence the apical part of the lung itself, and at best they can secure an expansion in only two diameters. Gymnastic training, which in the majority of cases leads to unnecessary development of the costal respiratory movements and expansion of the chest, is attended with a partial or complete loss of the natural action of the diaphragm. In men so trained not only heart

¹ Beiträge f. inn. Medizin, vol. x.

² Semaine Médicale, January 13, 1909.

³ Ibid., 1907, p. 431.

⁴ Ibid., March 3, 1909; Lancet, 1909, vol. i, p. 780.

⁵ British Medical Journal, August 29, 1908.

trouble, but also apical phthisis is apt to occur, as may be seen in the writings of Lieutenant-Colonel Davy and Lieutenant-Colonel Deane.

APEX INEXPANSION AS A RESULT OF NASAL OBSTRUCTION of all kinds has been pointed out by G. Lemoine¹ in connection with a study of 54 cases, 22 of them presenting weakening of the infraclavicular inspiratory murmur. In 8 cases in which the left nostril was obstructed the diminution in inspiratory loudness occurred only three times at the left apex:—the right apex suffered in all the remaining cases, including those of bilateral nasal obstruction as well as the right nostril cases.

Massive Collapse of the Lung occurs according to W. Pasteur's² description of it mainly in the lower lobes, and as a result of paralysis of the diaphragm which so frequently complicates diphtheritic paralysis. One of its clinical signs, not much noted, is respiratory overaction of the lower ribs, which disappears when the diaphragmatic function is restored. There is a marked contrast in the mechanism of the massive collapse as compared with that of the lobular. Bronchiolar occlusion which produces the latter passively is not the mode of causation of the former. The mechanism is active as it were, through the operation of the elastic property of the lung. This view of its mechanical production is not limited to the massive collapse from paralysis of the diaphragm, but seems to be equally applicable to cases of reflex inhibitions of diaphragmatic action, and to allied postoperative conditions.

Percussion and the Absolute Values in Percussion. Whether percussion or auscultation reveals the earlier pulmonary changes depends upon the observer, the observed, and the observation. The main difficulty is that the alterations to be recognized are so minute as to fall almost within the range of physiological peculiarities, and to require the highest combinations of hearing, training, and knowing for their identification and for their interpretation. It is apparent that early diagnosis by either of these methods alone depends largely on the skill and the standpoint of the observer. In the observed there are adverse or favoring conditions (relative thickness of the parietes, shape of the chest, tenderness and muscular response, nervousness and ill-regulated breathing, etc.), which being heaped up may make or mar the value of the examination. Next comes the *modus observandi*: fine conclusions are absolutely unreliable from the ordinary single audition. If the ear is to be the judge, it must get the evidence; and the evidence cannot thinkably be limited to a single moment of sound production, which may be an exceptional sound production governed by the moment. Two unknown patients happen to come into the consulting room whose voices are similarly slightly harsh—so slightly that they both are unconscious of it. How shall I tell from the sound alone whether this harshness is their own ill-favored natural voice or whether it is pathological. The fine

¹ Société Médicale des Hôpitaux, December 18, 1908.

² *Lancet*, November 7, 1908.

ear of an every-day companion can decide that point, and so could mine if only I knew what that voice ought to be; today I can only perceive what that voice is.

The individual chest is as much of a musical instrument as the individual violin, and we require for the recognition of any earliest "off-tone" an individual personal knowledge of it, a most skilled performer, and a trial with the best strings on (meaning by strings all the attendant circumstances)—facilities which are not easily to be found in combination.

These considerations carry their own practical conclusions when applied to the truly desirable, but rarely realizable, pretensions of C. E. Waller's¹ method.

Let us study our patient's chest day after day, first during health and steadily after, and we may then perhaps obtain those percussion values which are absolute for that particular patient.

Waller has set up a scale of average alterations in the sounds of percussion applicable to various types of chests, which is in itself most suggestive and educational, a splendid exercise for the would-be percussor. The gamut of these alleged changes, supposed to be capable of absolute identification, "runs through the entire chest trouble, from the earliest infiltration with tubercle to absolute solidification. First to be noted is a shortening of the typical non-tympanitic pulmonary percussion, brought out at the end of quiet expiration or at the beginning of inspiration by a very light stroke, with a slight added tympanism from the relaxation of the congested lung. At the stage beyond this the non-tympanitic sound with light percussion is absent during the whole expiration phase until the depth of respiration had filled the lungs. With growing infiltration the normal pulmonary note may be brought with slightly greater force of percussion. Lastly a suitably strong stroke for the stages of consolidation will discriminate between a fourth and a fifth degree of dullness, in one of which the pulmonary note may still be recognized and in the other not."

This is splendid (and credibly true), "*mais ce n'est pas la guerre.*" We need our identifying cue at the beginning if it is to win our battle against tuberculosis. Waller's earliest change does not tell "tubercle" for certain just at the time when the information is needed; its proof comes only *in cauda*.

POSTURAL LUNG DULNESS; ITS VALUE IN DIAGNOSIS AND TREATMENT. Albert Abrams² short but wide ranging article touches upon many practical points. It is worth mentioning that Tucker Wise's postural treatment of pulmonary tuberculosis by the prone inclined couch—a method which Abrams is beginning to try—has already yielded good results, which have been announced by its author.³ Grocco's sign when

¹ American Journal of the Medical Sciences, April, 1909.

² Medical Record, April 3, 1909. ³ PROGRESSIVE MEDICINE, September, 1908.

occurring in a healthy chest, as it disappears in the prone posture, is regarded by Abrams as due to a muting of the spinal resonance by passive lung hyperemia instead of by effusion as in pleurisy.

The principle of deadening the superadded or "sounding-board" vibrations of the sternum was introduced and is used by him for finer purposes of percussion.¹ Fig. 3 shows his vibrosuppressor in use. The pressure of the pad is regulated by the thumb-screw depicted.

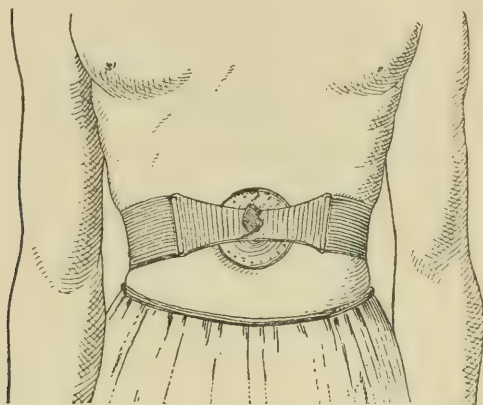


FIG. 3.—Method of application of the vibrosuppressor.

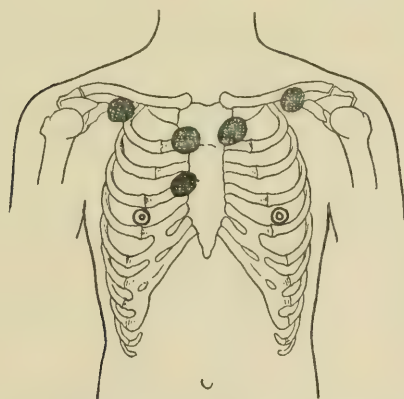


FIG. 4.—Atelectatic zone on the anterior surface of the chest.

With this and other precautions he detects in the chest of healthy children and adults a definite distribution of atelectatic spots (average size of a dollar or less) disappearing under the lung reflex test or deep breathing—which is also that of election for chronic tuberculosis. Their etiology is related, he thinks, to the conditions which he has described

¹ Medical Record, December 14, 1907.

as "pulmonary anemia" and as "acute lung dilatation," the latter to be explained as a neurosis. Cocaine applied to the nasal mucosa, being capable of allaying any irritation variously present either in the one or in the other set, may thus induce or remove the dulness. Pleximeter percussion is stated to manufacture, through the operation of the lung reflex of contraction, the dulness which it elicits.

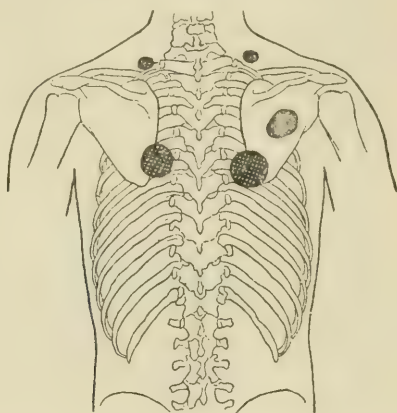


FIG. 5.—Atelectatic zones on the posterior surface of the chest.

The "pretuberculous lung" with its abnormal vulnerability is to be regarded as an "essentially emphysematous lung," with little respiratory change in its resonance and in its movements, whether of thoracic or of phrenic origin.

POSTURAL DULNESS IN HEALTH. The changes are lobar rather than lobular, and are independent and not liable to any check from any influence—such as the lung reflex, the cocaine test, or forced breathing—other than that of posture. They are roughly analogous to those observed when an effusion is free inside the pleural cavity. Thus the following results arise from:

Leaning Far Forward. Anterior chest region diffused dulness, especially marked in a definite area (Fig. 6). Posterior chest region hyperresonant.

Leaning Far Backward. Posterior chest region shows diffused dulness notably in a definite area (Fig. 7). Anterior chest wall yields a hyperresonant percussion note.

Leaning to One Side. Side of chest wall toward which patient inclines shows dulness, whereas the other side is hyperresonant.

Lying on One Side. Side of chest on which the patient lies demonstrates dulness of the lung, including the apex, whereas the other side is hyperresonant.

Recumbent Posture. The anterior thoracic wall is decidedly more resonant than in any other posture.

Prone Posture. The posterior thoracic region is more resonant than in any other posture.

Exaggerated Trendelenburg. Slight dulness of the pulmonary apices; lower chest region hyperresonant.

The explanation suggested by Abrams is the variation in the local fulness of the pulmonary circulation—this being unprovided with any

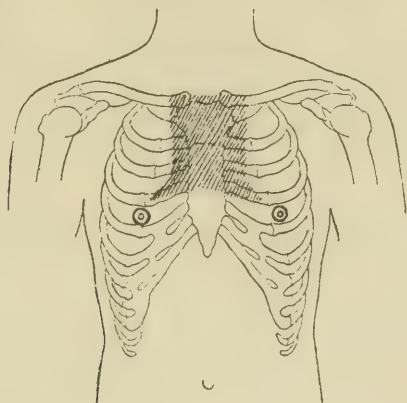


FIG. 6.—Dulness on the anterior surface of the chest when the patient leans far forward. The point of maximum intensity of the dulness is at the sternal insertion of the second ribs

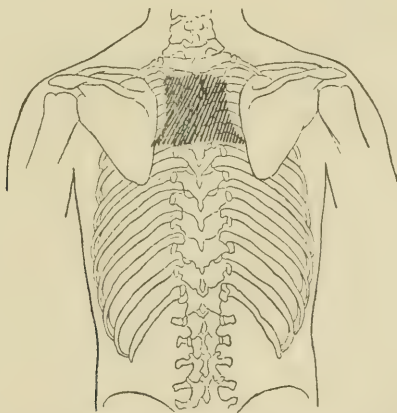


FIG. 7.—Area of dulness when the patient leans far backward.

vasomotor controlling nerve mechanisms. This variation becomes perceptible in the regions possessed of large sized vessels such as those depicted and the lower thoracic paravertebral region.

Postural Lung Dulness in Disease is very obvious in congestion, and particularly in that of cardiac origin. It is less obvious, he thinks, in the pretuberculous state and in pulmonary tuberculosis for which he

now uses the inclined plane. It is essential to distinguish between lung atelectasis and lung hyperemia, and for this he has supplied a method.

In connection with the early diagnosis by physical signs Clive Rivi  re's¹ suggestions for the routine of chest examination are worth remembering. They are based upon William R. Huggard's paper on "Pulmonary Atelectasis in Adults," showing that if percussion of the chest precedes palpation it is not unusual to recognize temporary collapse at the apex of one or other lung.

There is a risk that if we omit to demand deep breathing during palpation we may conclude, on auscultation, that the lung is not expanded and that any simple crepitations which are heard are those of early phthisis. This risk will be avoided if we modify the order of our examination to this order: (1) Inspection, (2) percussion, and (3) palpation.

Naked Ear versus Stethoscope. Lewis A. Connor,² of the Cornell University, pointed out two years ago, under the heading of "Certain Acoustic Limitations of the Stethoscope and their Clinical Importance," the value of immediate auscultation—and it should be pointed out that Connor's criticism of the stethoscope was aimed solely at the ordinary binaural stethoscope, and was not to be taken as truly applying to all forms of the instrument.

The great majority of sounds arising in the heart are heard somewhat more distinctly through the stethoscope; but in certain cases of aortic insufficiency the faint, high-pitched, whizzing, diastolic murmur might be clearly heard with the naked ear when quite inaudible through the stethoscope. No other heart murmur or sound showed the same failure; though probably some of the murmurs of mitral or tricuspid insufficiency, having somewhat the same character, might share in some degree in that peculiarity.

In regard to the lungs, Connor found that the group of sounds transmitted more clearly to the ear direct comprised a considerable proportion of all the bronchial and amphoric breath sounds, the faint and high-pitched sounds showing the peculiarity most distinctly.

A ready explanation had been furnished by Hallock's experiments which record graphically the wave lengths of various sounds by means of K  nig's manometric flame. It was found that the vibrations of the highest pitched tones were altogether checked by an elastic tube some six or eight inches long, and that only when this was replaced by a rigid tube could the vibrations be registered by the movements of the flame. Moreover, with a flexible stethoscope bone conduction must, of course, be lacking.

Since the publication of Connor's lucid and instructive paper, the claims of the rigid stethoscope, which for many years I have advocated,

¹ Lancet, June 8, 1907.

² New York Medical Journal, July 13, 1907.

have continued to be urged. In France even this stethoscope has been extensively discarded, and there is no denying the fact that, taking it all around, "chest-to-ear" auscultation is the best; at any rate, it is almost exclusively practised by some physicians. This is not, however, always a convenient nor a very practical proceeding. While recommending the greater safety of "naked ear auscultation," the next most reliable method should be taught and practised first, and that is the rigid stethoscope auscultation. The flexible binaural stethoscope will ultimately be resorted to, but the student will have realized that its use is a somewhat treacherous luxury.

THE PLEURA.

The Diagnosis of Effusion by Means of Grocco's Triangle of Paravertebral Dulness. An answer to the skepticism of Roch and Dufour¹ is supplied by the investigation of M. Matthes.² Roch and Dufour's opinion is obviously based upon their having noticed some other paravertebral dulness and is not based upon that triangle which is unerringly produced by free fluid in the pleura, and which is made to disappear by its evacuation or by the *postural crucial test*. Matthes' skiagrams prove that the dulness is neither due to displacement of the mediastinum nor to pulmonary collapse, while the disappearance of the dulness when the pathological fluid is removed shows that it is not a physiological condition.

There are paravertebral dulnesses of various shapes and origins,³ including that dulness which belongs to the bones and muscles of the back, and any dulness that may radiate across from a consolidation or a tumor. But there is only one of them which is of any use to us when our purpose is the detection of fluid—the "Triangle," precisely as it is described by Grocco. Should opinions differ as to its presence, the question would arise as to the relative accuracy of the percussion. As the dulness is not a "dead dulness," but a partial dulness only, the pleximeter undoubtedly gives an advantage to those trained in its use, by yielding a much more definite note of dulness.

Had we no means available for discriminating between any spurious products of percussion and those that are genuine, and between Grocco's triangle due to fluid and any other paravertebral dulness not due to fluid, there would be a better excuse for confusions and for resulting doubts, such as have recently found expression in the *Lancet*, and as late as May 8, 1909, in the *New York Medical Journal*, and which have delayed the general acceptance and use of a very simple and reliable method. That

¹ *Semaine Médicale*, 1908, No. 43.

² *Med. Klinik*, Berlin, September 20, 1908.

³ The greater part of this article appeared in the *Lancet*, June, 1909, and is reproduced with the editor's kind permission.

excuse ceased to exist after the publication of the article on the "Crucial Test and Counter Test."¹ If a dulness should disappear from the back on lying on one side and reappear on lying on the other side, it is not likely to be due to the bones and muscles of the back. Neither can it be the product of a pneumonic consolidation or of a tumor, unless we imagine that these can materially alter their relation to the chest wall (of course, with due reservation for any pleuritic fluid complicating pneumonia).

Apart from absolute skepticism as to its existence the doubt which still prevails as to the cause of the phenomenon has been contributory to the delay. But the question has been thought not unworthy of the attention of anatomists, and one of the best results of this prolonged discussion is that it should have elicited such excellent contributions as those of Professor Elliot Smith,² of Cairo, and of Drs. A. and R. Keith,³ in addition to the suggestions by Dr. Forbes-Ross,⁴ all of whom recognize that the sign is a clinical one though the cause be anatomical, and that any satisfactory explanation must rest equally on clinical and on anatomical evidence.

THE THEORIES AS TO THE CAUSATION OF THE TRIANGULAR DULNESS.

1. It may be convenient to attach the name of the "*Pleximetric Spine Theory*" to that which is referred to by them (A. and R. Keith) in the following terms: "W. Ewart, who was the first in this country to explain the clinical signs of Grocco's triangle, ascribed it to the pleural effusion acting as a mute and preventing the vertebral column from conducting the pulmonary resonance."

Another view which is mentioned lies in reality outside the scope of the clinical question at issue, as it does not credit the effusion with the causation of the triangular dulness, but regards the latter as entirely physiological. "F. W. Forbes-Ross regards Grocco's triangle as a physical necessity of the anatomical conformation of the posterior chest wall; Roch and Dufour reach practically the same conclusion. Like Forbes-Ross, they ascribe the triangle of dulness chiefly to the musculature of the back." Their own conclusion in connection with that view has already been stated above. The pleximetric spine theory is not critically analyzed by the Keiths, but it seems to be discountenanced by their approval of three other theories described in their valuable paper.

2. *The Direct Fluid Dulness Theory.* This is the old original theory which assumes a bulging of the water-logged pleural sac into the sound half of the chest, sufficient to produce on percussion the paravertebral dulness.

3. *The Pulmonary Collapse Theory*, which will be presently discussed.

4. *The Posterior Mediastinal Mesentery Theory.* This is the original and most important feature in their communication. It is set forth in

¹ Lancet, 1905, vol. ii, p. 216.

³ Ibid., 1908, vol. ii, p. 1669.

² Ibid., 1907, vol. ii, p. 890.

⁴ Ibid., 1907, vol. i, p. 1773.

the following words: "The posterior mediastinal mesentery was described and figured by one of us in these pages some five years ago. It corresponds to the translucent triangle seen in the corresponding part of the thorax when the patient is examined in a suitable position by the aid of x -rays. This mesentery has been overlooked by anatomists owing to the body being hardened and always examined in the supine position, when the heart and mediastinal contents are pressed backwards against the spine. It can be well demonstrated during the course of a postmortem examination when the sternum and costal cartilages are removed. If the pericardium with its contents be then lifted forward the posterior mediastinal mesentery will be seen to stretch from the pericardium to the spine and to have a front to back extent of from one to two inches.

"In our opinion Professor Elliot Smith is justified in applying the term pendulum swing to the contents of the thorax; when a full breath is taken the heart and roots of the lungs can be seen to move forward and downward following the direction taken by the descending diaphragm. To permit that movement the posterior mediastinal mesentery must be slack and long; it is its slackness and extensibility that permit so free and easy an extension of the contents of one pleural cavity toward the side which has the higher negative pressure; the mesentery being triangular in shape, apex above and base below, retains that outline when pressed into the sound side by a collection of fluid on the diseased side, thus giving rise to a triangle of dulness such as is described by Grocco."

The Direct Fluid Dulness Theory is best described by reproducing with their kind permission their illustration from sections through the chest of a stillborn infant in whom a left pleural effusion extended into the sound side, just as Professor Elliot Smith's illustration shows encroachment of a right pleural effusion into the left chest.¹ "It supports those who regard Grocco's paravertebral triangle of dulness as due to a direct extension of the pleural fluid or contents from the diseased toward the sound side. In Fig. 8 the contents of the thoracic cavity are exposed from behind. The left pleural cavity is distended by a pleural effusion, the left lung being compressed toward its root, and the posterior mediastinal mesentery, formed by the approximated leaflets of the right and left pleuræ between the esophagus and aorta, bulges toward the right so as to compress the base of the right lung. The extension of the posterior mediastinal mesentery is best seen in the transverse section shown in Fig. 9, *b*. The heart also is forced toward the right. Were such a chest to be percussed out, an area of dulness to the right of the midline of the spine and corresponding to Grocco's triangle should be found."

¹ Loc. cit.

The Pulmonary Collapse Theory seeks some support from the observation made by me and appended to my original communication that an abscess below the diaphragm can give rise to a dull paravertebral triangle (which disappears immediately the abscess is evacuated): "Dr. Ewart believes that the fluid content of such an abscess acts, like a pleural effusion, as a mute on the spinal column. On theoretical grounds we should expect a subphrenic abscess to produce Grocco's triangle, but in a manner different from that supposed by Dr. Ewart. Recently Dr. W. Pasteur has dealt with 'massive collapse' of the base of the lung

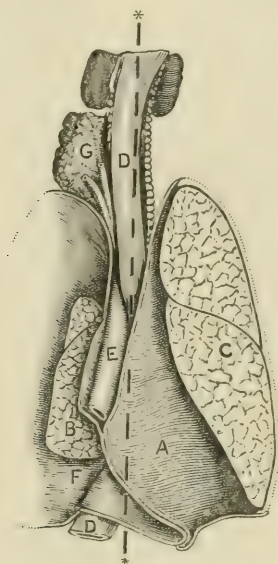


FIG. 8

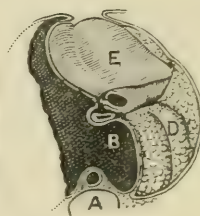


FIG. 9

FIG. 8.—The contents of the thoracic cavity exposed from behind. The line of the spinal column is indicated *---* (A) the posterior mediastinal mesentery bulging into the right pleural cavity; (B) compressed left lung; (C) right lung compressed at its base; (D) esophagus; (E) aorta; (F) left pleural cavity; (G) left half of the thymus pushed into neck.

FIG. 9.—Section of thoracic contents. (A) On body of vertebra; (B) left pleural cavity extending to right; (C) esophagus and inferior vena cava; (D) right lung; (E) right ventricle.

as a sequence of subphrenic abscess and other abdominal inflammatory states; he ascribes, and we think rightly, the pulmonary collapse to a cessation of action and relaxation of the diaphragm on the diseased side, a reflex inhibition following on the subphrenic inflammation. The dome of the diaphragm on the diseased side is found to be raised upward, there is a considerable diminution of the pleural space on the diseased side, with a corresponding loss of the elastic traction of the basal part of the lung. On the basal part of the sound side there is the usual negative pressure, with the result that the collapsed basal part of the lung on the

diseased side is drawn toward the sound side, giving rise to a triangular area of dulness."

Any criticism of the foregoing views must be confined to the main points. In the matter of theories it may be said with every deference that "safety is not in numbers." Three theories should not be required to explain one plain fact. If differing, they suffer mutual defeat; if similar, then their agreement should, in this case, be more absolute than it is to fit a quantity so strictly constant as the "triangle."

This constancy is the second consideration of a general order which is to the point. Grocco's triangle was originally introduced to us in precise terms of angles and of millimeters, its height alone undergoing variation, although the pleural effusions vary extensively in bulk. Subsequently, however, when I discovered in 1905 that it can also be produced by collections below the diaphragm, and in particular by ascites, I was able to point out that the base of the triangle was apt to be broader in the abdominal cases. Thus it may be said of all three theories that they agree neither among themselves, nor with the mathematical feature of the phenomenon they ought to explain.

As regards details, a principle of fundamental importance to clinicians in their study of intrapleural events is the fact that a lung laterally compressed by fluid retreats into the spinal groove by virtue of the posterior position of the pulmonary root above, and of the attachment below of the posterior edge of the lung by means of the ligamentum latum pulmonis. This recession and this attachment have always seemed to me to govern in effusion the persistence of spinal and vertebral resonance descending for some distance below the upper level of the fluid, and therefore the production of the S-shaped outline of dulness of Damoiseau. In upward compressions from the abdomen lifting the diaphragm, the same principle should hold good; and it is not easy to realize how the posterior pulmonary border could possibly vacate its groove.

Another principle is that whatever may happen to the anterior pulmonary border by way of collapse, or of enlargement, or of encroachment into the other half of the thorax, the pulmonary root and a fortiori the posterior border are incapable of any migration across the vertebral column. This is precluded by the attachments of the centrum tendineum to the spine on the one hand, and to the inferior vena cava on the other. The posterior vertical axis of rotation of the heart, which passes through the foramen pro vena cava from the liver up to the superior vena cava and the innominate artery, may be stretched in its upper part, and lower down it may sway slightly with the centrum tendineum and with the liver under the stress of powerful pressures, as in Elliot Smith's case. But this lateral displacement can amount only to very little; and the close connection of the spinal column with the pericardium and the posterior mediastinum, kept up through the vena azygos, raises an impassable barrier between the two spinal grooves, precluding any transference of viscera from the one into the other.

There is moreover, a new clinical fact which seems to leave little standing-ground for any theory dependent upon alleged oscillations of fluids or of viscera across the middle line. I have more recently realized that a Grocco's triangle can be percussed out on both sides of the spine in bilateral pleural effusions as well as in ascites. This is easily demonstrated by the skilful use of Sansom's pleximeter. The significance of this fact from the point of mechanism is obvious. The two triangles could not be produced by reciprocal encroachment by bulging; but they can be explained as the result of reciprocal percussion waves. A pleximetric conduction would also seem to be the only explanation available for the telling fact that the two triangles are almost always of uneven height, as the two effusions are rarely equal.

The conclusions may be briefly stated:

1. Grocco's paravertebral thoracic triangle of dulness, due to fluid free in the pleura, is rectilinear, not curved; and in other respects also it agrees with the description of it given by Grocco.

2. It is also produced by fluid collections in the abdomen; its base is then broader than in pleural cases.

3. In the latter neither its width nor its shape vary appreciably, but only its height; this rises exactly to the level reached by the effusion itself.

4. In bilateral cases of pleural effusion, a Grocco's triangle can be made out on both sides, in spite of the dulnesses due to the two effusions. As the effusions are seldom quite equal, two unequal Grocco's triangles are the rule.

5. In ascites and analogous abdominal cases the rule is for the two triangles to be equal; they therefore make up together a low but wide equilateral triangle bisected by the spine.

6. The simultaneous occurrence of a right and of a left Grocco's triangle is incompatible with the alleged causation by pleural bulging across the vertical column.

7. The same reasoning applies to the theory that a pendulum displacement of the intrathoracic viscera across the middle line might explain the dulness.

8. Anatomical considerations discourage the view that a collapsed pulmonary base can shift away from its own vertebral groove.

9. The assumption that a Grocco's triangle is produced directly by any fluid or other non-resonant substance immediately underlying it is negated by the circumstance that the general outline of the triangle is always "geometrically" the same, and is not contingent upon the innumerable variations in size and in shape which belong to fluid collections or to solidifications.

10. This is an argument in favor of the causation suggested under the name of the pleximetric-spine theory.

11. The same view is supported by the results of the *crucial test* and

counter test, which also afford proof of the genuineness of this clinical sign and of its helpfulness in the diagnosis of pleural and abdominal conditions.

The Treatment of Fibrinous and Serofibrinous Pleurisy should be based, according to F. T. Lord,¹ upon the ascertained fact that three-fourths of all primary cases with effusion are due to *tuberculosis* and the three- or four-tenths of the primary cases develop some form of tuberculosis within an average of four to six years. His discussion of the indications, estimation, and management of effusions, particularly of medium and small effusions, and of the operation of paracentesis itself should be read in the original.

F. Lommel's² account of pleurisy is another important paper of great value to searchers for the latest actualities, as it embraces many aspects of the subject in their most recent light.

The Treatment of Pleural Adhesions and Their Prevention. In view of our inability to prophesy as to the pathological and clinical importance which may eventually attach to any pleural adhesions being developed in our patient with pleurisy, it is of great moment that we should be able to eliminate them if they should form, or, better still, to oppose their formation. Remarkable suggestions have been made in both these directions.

The treatment of fibrous thickening and adhesions by fibrolysin (thiosinamin + sodium salicylate) is advocated by Schnütgen.³ He has used 2.3 c.c. injections of Merck's preparation locally or into the gluteal muscles once or twice a week, a painless proceeding sometimes followed by slight pyrexia, languor, and headache, but from which definite improvement was obtained in the objective and in the subjective conditions. He recommends that fibrolysin should be used immediately the effusion has undergone complete absorption, if there is any suspicion of adhesions being formed.

Systematic Respiratory Exercise in the Treatment of Pleurisy is another method of obviating agglutination, or at any rate of preventing the formation of the closer variety of adhesions which are capable of fettering the respiratory movements of the lung. G. Lagrange⁴ has an instructive practical paper on this subject, in which he testifies to the advantage which is gained, and to the fact that pulmonary tuberculosis, otherwise so frequent after pleurisy, does not attack those who are protected by this method. This practical therapeutic principle was urged some years ago by me and reported upon in *PROGRESSIVE MEDICINE*.

The Surgery of the Pleura is of practical concern to every physician. John B. Murphy's⁵ following views are worth knowing. "Besides the

¹ Boston Medical and Surgical Journal, April 15, 1909.

² Med. Klinik, Jahrgang v, No. 4.

³ Berl. klin. Woch., December 21, 1908.

⁴ Archives Gén. de Méd., January 7, 1909.

⁵ New York Medical Journal, February 13, 1909.

conditions claiming immediate interference, there are suppurative types of infection in which absorption of the toxin products could be stopped, sterilization of the fluid effected, and the necessity for opening the chest avoided. A number of agents have been used for this purpose: Perchloride of mercury with success, and formalin, with no toxic effect and great sterilizing power. In cases of excessive hydrops the secretion was almost stopped with one injection of the latter. Purulent cases were not cured with one injection, except in children. In pneumococcus infection in children, formerly the ribs were resected. With the aspiration and injection of two or three ounces of a 2 per cent. solution of formalin and petrolatum, prepared twenty-four hours before, and repeating the injections from time to time, as a rule, a cure can be effected. One injection might bring about a cure in some instances.

"In chronic cases, with dense, firm cicatricial tissue the same injections may be given, but act more slowly. The injection of formalin and petrolatum sterilizes the fluid contents and prepares them for absorption. In six months thereafter we should have a sanguinolent fluid, and in twelve months the patient is practically well without having any tube in his side."

Autoserotherapy in Serofibrinous Pleurisy. Schnütgen has added a further contribution¹ to the work of testing the value of Gilbert's method, which was described in a previous number of PROGRESSIVE MEDICINE and was also tried by myself in a few cases. Fede, who took up the study, was unable to furnish a satisfactory account of the rationale of its action, Nassetti² attempts to explain it partly by the mechanical stimulus of the puncture, and partly (in the tuberculous cases) by the inference that the antitoxic and bactericidal products may probably be taken up into the circulation. Schnütgen cannot suggest any other explanation, but his cases bear witness to the genuineness of the observation.

Gilbert's method consists in reinjecting under the skin 1 c.c. of the fluid aspirated from the pleura. It is possible to do this through one and the same puncture by withdrawing the point of the needle just far enough to bring it out into the subcutaneous tissue where the injection has to be made. In some cases this is followed by an early reabsorption; in others the injection has to be repeated, perhaps as often as five or six times; but it generally succeeds in finally drying up the effusion in tuberculous as well as in simple pleurisies. One definite advantage of the method is the fact that it is not necessary to delay its application, as in the case of paracentesis, for two or three weeks after the occurrence of effusion because of its likelihood to relapse.

Schnütgen has tried the method in various other conditions, such as hydrothorax and ascites, separate or combined, or simultaneous ascites,

¹ Berlin. klin. Woch., January 18, 1909.

² Riforma Med., 1908, No. 39.

hydrothorax and pericarditis, or hemorrhagic pleurisy, or beginning suppuration—but with no result except in two cases. On the other hand in his series of 15 cases of pleuritic effusion it was only once that the aspirator had to be used, owing to the urgency of the dyspnea on the seventh day after the injection treatment was begun.

It is worth mentioning that M. V. Carletti¹ expresses the opinion that Lucatello's practice of aspirating and of subsequently injecting oxygen is preferable to Gilbert's method, although he finds from the results of his twelve cases that the latter is more successful when modified according to his own technique. Instead of reinjecting the fluid immediately he allows it to stand at blood temperature for a time sufficient to allow autolysis to proceed.

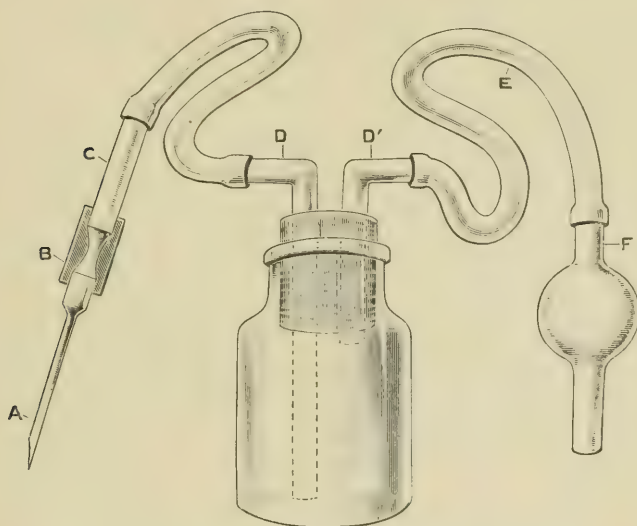


FIG. 10.—An improved device for exploratory aspiration.

Exploratory Aspiration is simplified by Henry Sewall's apparatus obtainable at the Durbin Surgical Institute Co., Denver. The muscles of the operator's mouth serve as the piston and the tip of his tongue as the valve of the syringe. The following advantages are claimed for it:

1. It is extremely simple. It may be constructed by any one possessing the necessary materials and moderate skill; the glass bulb *F* is a luxury.
2. It is easy to estimate the degree of suction force; this may be increased to any safe limit.
3. While with an ordinary syringe the needle must be removed from the barrel in case a single withdrawal of the piston has given a negative result and it is desired to try again, in the instrument here described

¹ *Gazetta degli Ospedali*, August 18, 1907.

any number of aspirations may be made with or without change in the position of the needle.

4. A needle of practically any size may be fitted to the tube *B*.

5. The bottle may be stoppered and its fluid contents transported for examination.

6. The needle can be held more steadily during aspiration by this method than when it is rigidly connected with a syringe.

Insufflation of Air in Thoracocentesis. C. Achard's¹ method does not differ in principle from previous ones, but mainly in the extreme simplicity of its technique. By means of an ordinary bicycle pump, ordinary unfiltered air is passed through the same bottle and tube as used for the outflow; there is no gauge, and only the patient's feelings are utilized as a guide when to stop. Very large effusions—*e. g.*, 4.25 liters in his patient; 4.8 liters (Vaquez), 4 liters (Dufour)—can in this way be evacuated with less risk of inducing dyspnea and albuminous expectoration.

Vaquez gives the results of 17 cases he has treated since 1902 by intrapleural injections of air or of nitrogen (10 were serofibrinous and due to tuberculosis, 2 cancerous, 1 chylous, and 4 empyematosus). In one of the cases of empyema a remnant of nitrogen was found in the abscess cavity eight months after the injection; two others died within thirteen months; in the fourth, pleurotomy was ultimately performed. These cases speak for themselves.

Vaquez considers that the action is purely mechanical and that no advantage is to be gained by injecting adrenalin according to Sir James Barr's method. His rule is to inject one volume of nitrogen in replacement of every two volumes of fluid removed.

COMMON COLDS.

Chill and Infection as Factors of Catarrh. Some sensible views are set forth by R. C. Brown² in a paper on "Factors in the Etiology of a Common Cold." They are so practical that they deserve wide publication and so rational that they call for little criticism. It is pointed out that those leading an outdoor life are conspicuously immune from colds. There is a great difference between exposure to cold and catching cold. When the body is put to an effort to conserve its heat, as in exposure to cold, there is not much danger of catching cold. But when the body is put to an effort to lose its heat, or is in other words overheated, there is great danger. When a skin area which is usually overprotected is exposed to a draught an overimpulse is conveyed to the vasomotor

¹ *Semaine Médicale*, September 14, 1908.

² *Medical Record*, New York, February 6, 1909.

centre resulting in excessive peripheral vasoconstriction and slight rise in temperature. The body which was attempting to lose heat finds itself further embarrassed, as the radiation from a considerable portion of the skin has been shut off. The turbinates being a means by which heat is lost, it is not strange that vasomotor impulses are sent to them, and their tortuous bloodvessels dilated.

In this we have an explanation for the habit of catching colds, and for their preventive treatment. The more often any nerve impulses travel through certain channels, the easier does the journey become through those channels. Thus, in a sensitized person, the slightest exposure will result in a cold in the head. On the other hand, through the intelligent use of clothing, of right living, and of baths, the skin may be kept in such a condition that it will send only normal impulses. The author, therefore, favors the view of the vasomotor origin of cold. I myself can hardly avoid the conclusion that chill is the determining factor of ordinary catarrhs, which become infective under unfavorable circumstances. These views should be laid to heart by those whose insurance against tuberculosis is not sufficiently secure.

The etiology and treatment of the common cold are ably illustrated in their two opposing aspects by the lucid papers of R. W. Allen,¹ who supports the infective origin and the vaccine therapy; and of John Curtis Brown,² who favors the vasomotor origin and finely analyzes its operations. He reminds us that though the nasal mucus is not bactericidal, Metchnikoff and others show conclusively that it rids the nose of a large number of germs in a purely mechanical way.

P. Cornet³ champions the view that recurring coryza is a manifestation of auto-intoxication. "Colds in the head," like asthma, or hay fever, are evidence of the arthritic diathesis, that is, of a family tendency to sluggish elimination of waste products and toxins. As the mucosa of the nose is an excreting organ, the excretion through this mucosa of some of the toxins generated in the digestive tract may be one of the factors in recurring coryza.

Arthur H. Paine's⁴ treatment of acute coryza is based upon true principles: (1) Rest; (2) (a) opening all channels of elimination, and (b) equalizing the circulation; and (3) fortifying the system to form antitoxin and overcome infection.

As drugs: One-half ounce castor oil as a first measure, followed by a hot mustard footbath and immediate retirement to bed with warm covering. A mixture of aconite, belladonna, and sweet spirit of nitre, grading the dosage to fit the individual, every hour or two while awake. At bedtime, a Dover's powder, 5 to 10 grains. Cold water to be taken

¹ Lancet, November, 1908.

² Medical Record, February 6, 1909.

³ Presse Médicale, January 16, 1909.

⁴ New York Medical Journal, November 7, 1908.

freely, but no food until the laxative has operated and the bowels are quiet, then raw eggs and milk every two hours.

By these means the stage of purulent discharge will be aborted. Locally it may seem advisable to use some alkaline spray, as Dobell's solution, followed by a spray of

Camphor	gr. v
Menthol	gr. viij
Petrolatum	℥j—M.

This local treatment will be most useful in the late cases. The general after-treatment will then consist in forced feeding and tonics, such as quinine, gr. j to gr. ij three times daily.

For acute coryza we may also mention Boulai's atropine treatment,¹ reported as very efficacious. A match tipped with cotton wool is dipped into a solution of neutral sulphate of atropine, 1 centigram (gr. $\frac{1}{100}$); cherry-laurel water and distilled water, of each 20 grams (f℥v); and introduced by the patient as high as possible to swab the nasal mucous membrane. This is repeated every half hour at first, then every hour if required, but not oftener than ten times a day, and not for more than three days. Aconite in small doses is a useful adjunct, and a menthol ointment follows up the cure. This treatment is for early acute cases only, not for those with nasal obstruction.

The dry therapeutic inhalation described by C. Schütze² is of value chiefly in chronic catarrhal affections of the air passages. The Körting system consists in pulverizing by means of a strong current of air a concentrated brine, the droplets of which yield up their moisture to the air and leave behind a fine floating solid suspension.

Coke and Cough. "The Ungodly Cough" inveighed against in the *British Medical Journal*,³ elicits from Alfred Freer⁴ this interesting comment: "Much coughing was present in all three churches every winter. It used to make me angry, as I attributed it to disrespectful inattention on the part of the congregation. At one of these churches some 180 blue-coat boys attended. They used to cough incessantly, just like a pack of hounds finding 'scent' again after a very brief check. For years past now no such distracting nuisance is to be found, but remarkable freedom from it, and the dear blue-coat boys are as quiet as well-conducted mice. Why? Just because the buildings I speak of were formerly, but no longer now, heated with coke."

The Vaccine Therapy of Colds. This is described by Morrey⁵ as follows:

¹ La Clinique, September 6, 1907.

² Med. Klin., December 13, 1908.

³ November 28, 1908.

⁴ British Medical Journal, January 9, 1909.

⁵ Journal of the American Medical Association, May 1, 1909.

"Dr. R. W. Allen, in an article which appeared in the *Medical Record*, December 19, 1908, mentions four organisms and gives the dosage used for cure as well as for immunization. He also says that when there is doubt as to the organism, he uses a vaccine containing several of the organisms mentioned.

"My method is to use an autogenic vaccine prepared as follows: 'Blow' the nose thoroughly to clean out contaminating organisms. Swab out each nostril with a diphtheria swab and inoculate two (to guard against possible loss) agar slant tubes. Incubate twenty-four hours. Prepare a vaccine in the usual way from the growth and inject one cubic centimeter (less for children) hypodermically. The results in the few cases treated by me are most surprising, the colds in each instance disappearing in twenty-four hours. In one experiment, the immunity has apparently lasted nearly two months. One patient is not 'subject to colds,' but the others are, almost continually during the winter.

"The number of bacteria injected has not been estimated, nor has the opsonic index been determined. One injection has been sufficient in each of the three experiments."

A Treatment of Intractable Hay Fever and Paroxysmal Coryza by Resection of the Nasal Nerve is described by Yonge¹ as a method for desperate cases. He argues that although the nasal branch of the fifth is not the only sensory nerve of the nasal cavity, as there are filaments (principally derived from the sphenopalatine ganglion) distributed to the posterior parts of the cavity, it is responsible for the sneezing and other normal reflexes and also for the abnormal reflexes of coryza and hay fever, as shown also by the situation of the irritable areas. As regards results, bilateral resection has successfully ended various forms of vasomotor rhinitis, one of the cures being that of an inveterate sufferer of fifteen years' standing from hay fever, intermittent coryza, and asthma.

Acute Obliterative Bronchiolitis has been duly diagnosticated and verified after death in four cases by A. Fränkel² since his original description of the affection seven years ago. The condition is found chiefly among those working in irritating or acid-laden atmospheres. The lungs are highly emphysematous and suggest tuberculous "granulie." This appearance is due to the presence within most of the bronchioles of an albuminous material more or less completely choking them. The lesion differs from the analogous bronchiolar plugging seen in some cases of pneumonia in that it is here universal, not restricted to the inflamed portion of the lung; and, moreover, that the condition involves the entire bronchiolar tract, including the alveoli, with the single exception of the infundibula, whose muscular contractility is probably a

¹ *Lancet*, June 13, 1908.

² *Semaine Médicale*, December 23, 1908; also 1901, p. 360.

protection. The affection is very intractable and should be prevented, as it cannot be cured, by improving the faulty atmosphere.

Edema of the Eyelids in Influenza. An epidemic of influenza characterized by edema of the eyelids is described by N. I. Spriggs.¹ There is little doubt of the influenzal origin of the edema. About half the cases had other influenzal symptoms; and those who had not any were found to reside in a house where influenza was prevalent. Finally, no cases have been recorded apart from an epidemic of influenza.

Diagnosis. This may be hard or impossible in an isolated case, or in the first of a series, and frontal sinusitis or angioneurotic edema may be considered. The presence of other influenzal symptoms in the same or in other patients will soon clear up the difficulty.

Edema of the eyelids, generally associated with bad frontal headache, may be an early symptom of influenza. This may or may not be followed or accompanied by pyrexia and other general symptoms.

Prognosis and Treatment. The prognosis appears to be excellent. The usual lines of treatment for influenza should be followed. Cold compresses or cold boric eye washes appear to hasten the subsidence of the edema.

ASTHMA.

The Etiology of Asthma. Putting aside the inevitable microbe—and it is said that a microbe has recently been isolated by Carmalt Jones which he believes to be the cause of certain cases of asthma, and from which he has prepared a vaccine which in many cases he has used with success—in broad outline two agencies are concerned in the production of an attack of asthma, a “neurotic” medulla and a peripheral stimulus or exciting cause. The latter undoubtedly often consists of the irritation of the sensitive nasal nerve filaments or of their neighbors, the olfactories. But it may reside in the gastric or some other function. In Wall’s twenty-three cases associated with nasal defect marked improvement resulted from appropriate treatment in fourteen. It is noteworthy too that the exciting stimulus may be cerebral; for instance a mental association between certain localities and any previous attacks, or the mere thought or expectation of a possible seizure, will light up the mischief, as testified from personal experience by Hertz and other sufferers.

Experimentally, Dixon has shown by tracings, the diminution in the volume of the lungs which follows upon stimulation of the vagus of a cat. This illustrates the similar change which results from a reflex stimulation of the nasal mucous membrane, as well as the action of drugs in inhibiting the spasm. According to Albert Abrams, bronchial

¹ British Medical Journal, December 12, 1908.

spasm can be induced by packing the healthy nostrils with cotton wool; and that spasm fails to appear if cocaine were first applied to the interior of the nares. Hence, cocaine applied in this fashion may mitigate the asthmatic attack and other drugs may likewise numb the nerve centres, or render the bronchial mucosa insensitive.

The other factor is the hyperesthetic medullary perversity for which physiological rectitude has to be substituted. The questions of its origination and of its cure open up an unlimited field; and auto-intoxication has been for some years a favorite theory. In practice it is surprising how much benefit may follow attention to simple hygienic measures to improve the digestion, the regular action of the bowels, and the avoidance of fatigue. These are the amenable cases which encourage our hopes, but do not justify us in expecting quite so much in more severe and inveterate sufferers.

The truth about asthma is that it is an antiphysiological unruliness, occurring in function which is viscerovoluntary. The sympathetic and cerebrospinal systems go shares in the mutiny; but sometimes one and sometimes the other is the leader; and success depends upon our knowledge of which. Failing that knowledge we see clearly that it is discipline that is wanted to be restored; and that, since a beginning must be made somewhere, the easier by far of the two rebels for us to attack is the neurovoluntary function, namely, the conscious and responsible mechanism of breathing. If this can be steadied, like a tame elephant it will sober its partner. Hence the value of common, unsophisticated, muscular respiratory drill.

The Treatment of Asthma. It cannot be said that any great stir has occurred for a twelve-month in this difficult region of therapeutics. We are presented with excellent compendium discussions and compendium papers. Such are those by Auld,¹ by W. Lloyd,² by G. Treufel,³ and others; and the discussion before the Royal Society of Medicine in March, 1909. These are, too, the general reviews of the therapeutics of the affection, such as that in the *Journal of the American Medical Association*.⁴ That able review does not overlook the mysterious, seemingly wholly neurotic, *quasi* epileptic or migrainous cases. Firm ground is found in the fact of bronchial spasm with its interference with the proper mucous membrane function and with the help which eupnea gives to the heart. What of the blood? Laennec's "perles," and the "spirals" of Curschmann, and the Charcot-Leyden crystals are hard problems in mucus; but the eosinophilia is the Sphinx—and we are held up.

Thus limited at the beginning of our rational treatment, we take heart of grace in common sense, and cling to honesty in empiricism.

¹ British Medical Journal, December 25, 1908.

² Ibid., January 16, 1909.

³ Deutsche med. Woch., December 31, 1908.

⁴ Vol. li, p. 2160; vol. lii, p. 50 et seq.

Hygiene is the fulness of wisdom even in the cavern of shadows; and saves us from quarrelling with our ignorance. But the patient takes the plunge into a sea of drugs if we should hesitate to venture; and quackery beats our science hollow in breasting the unknowable in therapeutics. In asthma, alone of all diseases, we have ceased to dispute that fact, or to resent it.

Which are our own best "legitimate" remedies, if any are of service? As a preventive the treatment by *iodide of potassium* and by *bromide* claims to be successful—in lessening the central irritability and in improving the local bronchial function. The sodium salts may be prescribed as less depressing. For the rest our drugs can only aim at correcting any cause of inefficiency in the physiological working of the several functions of skin, nerve, muscle, gland, circulation, digestion, respiration, excretion, etc.—it is analyzed practical hygiene.

The plot thickens when we approach the paroxysm. Romeo's Apothecary's heroic cure, "to sleep it out and to wake up again to easier times," is quite feasible in our days; but whether induced by anesthetics or by opium, the prolonged unconsciousness does not appeal to patient or to physician. The alternative for that supreme remedy, the timely injection of morphine, has almost greater dangers than *narcosis simillima morti*. The merely stupefying narcotics can never cure, but because they remain wanted again and again their evil effect accumulates and undermines.

Besides the anesthetics such as chloral and chloroform and the opium group, we have the great group of belladonna, stramonium, and hyoscyamus, atropine (and perhaps hyoscine) being the chief agent.

Muscular relaxants, such as emetics and nicotine; circulatory depressants, like lobelia and grindelia robusta; and circulatory stimulants, like caffeine or strong tea and coffee, and strychnine; vasodilators and vasoconstrictors have all been tried and found to be more or less useful, even sometimes *mirabile dictu*, when used in combination. But their deadly powers are as nothing compared to the effects of the good old fumigation.

Unfathomed still is the stupendous fact that the quintessence of idiosyncrasy, of delicacy, of irritability, and of nerve response to quite intangible stimuli even so subtle as thought itself, a delicacy often curable only by the purest air of mountain or of sea, capitulates at once to the coarse argument of smoke. And this smoke in ultimate analysis contains besides all its choking properties and its heat, and besides so much of "live" but mostly of "cremated" drowsy drug principles—the irresistible $\text{CO}_2 + \text{CO}$. Oxygen inhalation sometimes relieves, though more often not. But CO_2 inhalations always compels the chest to breathe, according to my former clinical experience and to the recent experiments of physiologists.

We are not surprised to find a great variety of drug treatments recom-

mended. Wall has found the most useful remedies to be iodide of potassium, arsenic, and stramonium (of the last the extract is better than the tincture). The nitrites, atropine, adrenalin, and acetone are in some cases of benefit. Morphine is very valuable, but for the danger of establishing the habit. Spriggs has used with success injections of $\frac{1}{100}$ grain of atropine, repeated in an hour if necessary.

The article on "Therapeutics" concludes thus on page 51 of the *Journal of the American Medical Association*: "If we were to sum up the best treatment for the paroxysm of asthma, we must say: morphine and atropine hypodermically, the administration of nitroglycerin by the mouth, adrenalin or other suprarenal sprays for the nostrils or throat, or tablets containing suprarenal dissolved in the mouth, fumigations with potassium nitrate and stramonium, and cocaine applications and sprays, if must be."

THE TREATMENT OF ASTHMA BY LIGHT BATHS. Strümpell, of Breslau, founds his "light bath" treatment upon the alterative effect upon those neurosecretory and vasomotor irregularities of the bronchial mucous membrane which he regards as analogous to urticaria in the skin and to colica mucosa in the bowel. One out of twelve inveterate cases resisted, but the others yielded to the effect, which is permanent, after a daily or almost daily, course of about four to six weeks; the patients sometimes think themselves cured after two weeks. It is well to begin with five-minute local exposures to eight or ten lights, increasing the duration to fifteen or twenty minutes until the general bath can be given with forty lights. After the bath, the patient steps at once into a hot-water bath, to clean sweat off the skin, and then goes to bed for two hours.

Alois Strasser,¹ after sixteen years of hydrotherapeutic endeavors, not always successful, has now turned to A. Strümpell's electric incandescent light baths for the treatment of bronchial asthma. Working on Strümpell's lines, he fully confirms his view as to the benefit. Strasser has varied the after-treatment by substituting light exercises for gradual cooling after the ten minutes' bath. He finds that asthmatics take as long as seven to eight minutes to obtain their profuse sweating. The treatment will cut short a mild attack at its acme, although Strümpell does not recommend it for the climax. It is useful in hysterical cases of bronchial and cutaneous vasomotor spasm, and it probably influences the mucous membrane in its epithelium. Strasser's testimony as to the great value of the light baths is entitled to attention.

THE TREATMENT OF BRONCHIAL ASTHMA BY BREATHING EXERCISES. It is beginning to be understood that the rule that Nature teaches us automatically the correct use of our organs is not by any means universal in the human species. Nowhere is its occasional failure so conspicuous

¹ Monats. f. d. physik. diät. Heilmeth., January, 1909.

as in the field of respiration. It is not every child that knows how to breathe. But this is not all. Educational authorities have been slow to realize that before framing their schemes and curricula it was essential to obtain the necessary suggestions from the physician in his double magisterial capacity as a physiologist and as a pathologist. Had they done so, they might have made some provision for the teaching of the proper use of that wonderful instrument, the larynx, so that children might be taught not only singing and articulation, but how to speak; that is, how to phonate and modulate; and also how to laugh; that they might be saved through life the heavy handicap of a repellant, harsh, or grating timbre of voice. And likewise, on the pathological side, how to cough and how to sneeze, and how to clear the nostrils by means of the handkerchief, and the throat by gargling.

The opportunities which the teachers have neglected have been brilliantly turned to account by "lay practitioners," who by the simplest methods derived from physiology have achieved the most satisfactory results in a variety of cases ranging from simple stammering to asthma.

In a previous issue of *PROGRESSIVE MEDICINE* reference was made to the practice revived by Alexander Morison and long practised by myself in the various conditions of dyspnea, by bimanual pressure on the distended chest during expiration. He had found it useful in cases of asthma. I myself have been in the habit of supplementing this passive assistance by the active help of systematic expiratory exercises for which I have adapted a bubble-blowing apparatus. Other devices had been formerly in use—one of them being Sibson's whistle.

These principles have recently been elaborated by Hofbauer,¹ details of which he describes in a paper read before the Gesellschaft der Aerzte in Vienna.

It is noteworthy that Hofbauer associates with his expiratory treatment, which consists in teaching the patient to take long expirations, to avoid waste of energy, and to make the inspirations as short as possible, the influence of electric currents, which the patient uses at his own home. They are to be used only intermittently. Günzel² has used *high-frequency treatment* in 50 cases. "This current passed through an aching nerve renders it insensible, and it can be used to induce local anesthesia, to cure neuralgia, rheumatoid pain, etc. In an acute attack of asthma the electricity rapidly soothes and the spasm subsides. From two to four applications at one-hour intervals relieve and cure the attack of asthma without necessity for morphine."

DIPHThERIA ANTITOXIN IN ASTHMA. In a paper under the heading of "Untoward Results from Diphtheria Antitoxin, with Special Reference to its Relation to Asthma," H. F. Gillette,³ of New York, makes the

¹ Lancet, i, p. 798.

² Berlin. med. Woch., November 9, 1908.

³ Therapeutic Gazette, 1909, p. 159.

following weighty statements: "The *Journal of the American Medical Association* published, in 1908, several reports of death or collapse, following the injection of horse serum, and the reports are very similar.

"In a few minutes there is an intense dyspnea, followed by edema and urticaria. The action of the heart continues long after respiration has ceased.

"J. Solis-Cohen suggests that possibly the urticaria and the edema which affect the mucous membrane of the mouth and pharynx may extend to the smaller bronchi, with an exudate which mechanically blocks the air cells. In some of the cases froth poured from the mouth, showing that the exudate was considerable.

"This theory does not displace the theory of central origin of the disturbance, because the serum must influence the nervous system before the urticaria and edema can be manifest, and because urticaria, edema, and asthma are neuroses. Urticaria with difficulty of breathing has been reported many times after the ingestion of certain articles of food.

"Personally, my own experience confirms the above views. For three years previous to November, 1907, I had attacks of asthma every time I was about a horse or stable. On October 19, 1907, I received 2000 units of antitoxin globulin, and fifteen days later I received 3000 units of diphtheria antitoxin. But slight reaction followed the first dose, and a mild reaction resulted from the second dose. Since the last dose I have had no asthma, and the irritation of the eyes, nose, and throat when about a horse has also ceased to annoy me.

"If we are called upon to administer any of the sera to a subject who has asthma, or any asthmatic condition, hay fever, bronchitis, acute or chronic, or where the subject is susceptible to the odor of a horse or stable, or has suffered from angioneurotic edema, or is neurasthenic, we should inform the subject who is to receive the serum, and the persons interested in the outcome of the case, of its possible dangers before giving it, and try to avoid its use."¹

THE HEART.

A New Cardioscope, to be used while administering chloroform or ether, is described by Archibald W. Robertson.² The illustrations (Figs. 11 and 12) give a complete idea of the stethoscope and of its use. The disk is placed over that spot where the heart sounds are most distinct, and it is held firmly to the skin by a broad strip of adhesive plaster. The

¹ As asthmatics appear to be particularly susceptible to diphtheria antitoxin, it should be used in such individuals with extreme caution. The majority of deaths following diphtheria antitoxin have been in this class of patients.—EDITOR.

² *Journal of the American Medical Association*, March 27, 1909.

rubber tubing is of sufficient length to pass backward under the clothing. The ear pieces are light, are not pressed against the head by springs as in the older styles of stethoscopes, and can be worn for hours without unusual discomfort.

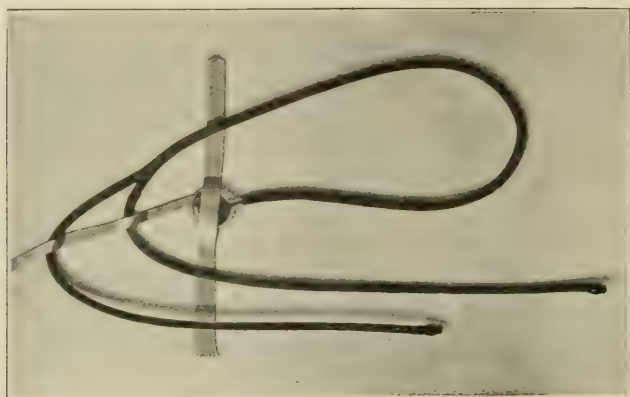


FIG. 11.—New cardioscope.

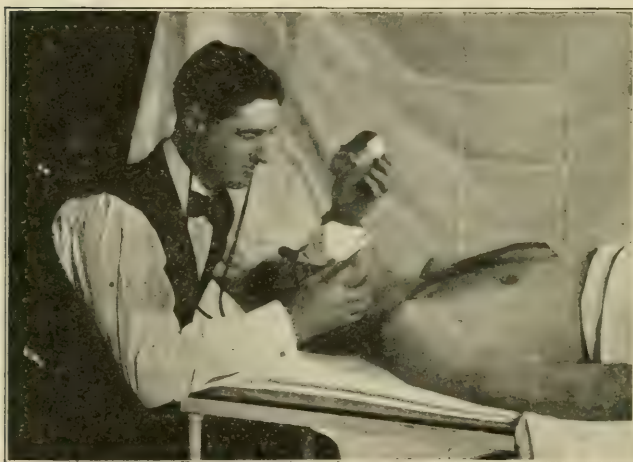


FIG. 12.—The cardioscope in use.

The advantage of noting the action of the heart is great. The practical objection that the anesthetist, with both ears blocked, is isolated from verbal communications might be obviated if the stethoscope were a monaural one, such as that used by the late Sir Andrew Clark and by others suffering from unilateral deafness. The facility for monaural hearing is quickly acquired.

The Prevascular Dulness. Diagrams are poor substitutes for faithful tracings of the actual outlines of organs. No clinician need, however,

deny the value claimed by Nicola Trulli¹ for the systematic percussion practised in the Clinical School of Rome. The accompanying schema shows the lines and angles or points regarded as essential for a proper examination, and includes a determination of the width of the great bundle of cardiovascular structures above the heart. These essentials are as follows: (a) The right limit of cardiac dulness; (b) the right margin of the heart; (c) the upper limit of relative liver dulness; (d) the heart-liver angle; (e) left limit of the cardiac dulness; (f) the left upper margin of the heart; (g) the angle between the heart and the large vessels; (h) the left lateral margin of the heart, and (i) the lowest point of the heart on the left. Two triangles are thus obtained in addition to the quadrilateral prevascular dulness.

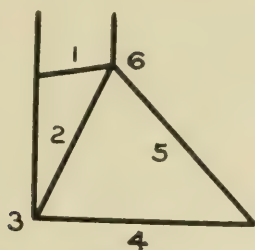


FIG. 13.—1, width of the “cardiovascular bundle;” 2, bases of the heart; 3, heart-liver angle; 4, right ventricle; 5, left ventricle; 6, cardiovascular angle.

From the variations obtained in these values during the progress of a case, Trulli has derived important conclusions as to the changes occurring in the size of the heart and of the vessels; and I agree with him in respect to any strict markings such as that of the extreme apex beat. I pointed out years ago that there is no scientific value and much clinical misleading in percussion unless it be, not of the cardiac dulness, but of the heart itself. What a physician wants is the size and the shape of the heart, and the same is true of the great vessels. What does it avail him to know that “the dulness” has increased or diminished by so much more or less of expansion of the sternal fringe of the lung? Underneath this delusive covering the true variations in the diameter of the heart itself are constantly proceeding and are capable of accurate determination by suitable means. For those guided by the latter, the measurements obtained by the method under review, and of that still commonly taught to students, are to be accepted as pulmonary measurements, not as heart measurements; they do not measure the heart, but only the exceedingly mobile and wide variations in the gap between the fringes of the right and of the left lung. As a skeleton sketch, the

¹ Il Policlinico Sez. prat., September 20, 1908.

Roman diagram is a useful exercise, but it needs to be clothed in its myocardium for the physician's purpose.

THE VALUE OF DIMINISHED CARDIAC DULNESS IN THE DIAGNOSIS OF CANCER is again insisted upon, with further experience, by W. Gordon,¹ who three years ago described a diminution of the cardiac dulness in the recumbent posture in some cases of cancer.

As regards measurements, Gordon deals only with the diminished width of the dulness, starting from the midline of the sternum. He refers to all cardiac dulness under two inches wide as "diminished," and to all over two inches wide as "ordinary."

It is clear from this that an absolute delimiting percussion method was not employed; and that as no other means was resorted to to define the exact boundaries of the heart, such as those offered by skiascopy and skiagraphy, the end and object of the inquiry was not so much to ascertain the actual size and position of the individual heart as to identify the fact that the normal precordial distribution of dulness and resonance was altered in a definite direction, and to attempt to show that this alteration was sufficiently constant to afford a basis for the diagnosis of cancer.

Gordon's own comments are suggestive: "With regard to explanation I have not much to say; the time is hardly ripe for it.

"(a) It is possible that the heart, in a case of cancer, may, like other muscles, become more flaccid than normal, and (judging from the anemia and small pulse so often present) may be less well filled than in health. If so, it may perhaps fall away from the front chest wall, on recumbency, more than a normal heart would. I have found, at least in some cancer cases, that the ordinary change in the cardiac dulness, when the erect position is changed to the recumbent, has been much exaggerated, so that a dulness as wide as, or wider than, normal in the erect position has become a typical 'diminished' dulness in the recumbent position.

"(b) It is possible that the lungs, like the abdominal skin, lose some of their elasticity in cases of cancer, so that a spurious emphysema may perhaps result from ordinary breathing. In two cancer cases, where a normal sized heart was found on postmortem examination completely covered by lung, microscopic examination of the pulmonary edges discovered no sign of ordinary emphysema.

"(c) Lastly, in many cases of cancer, the heart is known to become much reduced in size."

With much of this we can agree; and although it is difficult to discover in the sign in question any distinctive diagnostic value other than confirmatory, at any rate the considerations which have been suggested may enable us to admit the genuineness of the sign which it would be

¹ British Medical Journal, August 8, 1908.

difficult to suppose had been the subject of any misapprehension on the part of so good an observer.

In connection with the scale of measurement of the cardiac dulness adopted by Gordon for the purposes of his inquiry, it is essential to remember that this is not less conventional than "the heart's dulness," such as it is generally understood by the clinical student and his teacher. It has nothing to do with the shape of the heart itself. It cannot therefore tell us much about that heart; it tells us rather about the lungs. Take, for instance, emphysema, where the heart is liable to be greatly dilated; the cardiac dulness as obtained by ordinary percussion is reduced almost to nothing.

For this reason the "reduced dulness" described by Gordon in cancer does not carry its own explanation, but requires to be interpreted. The first step toward a correct interpretation would be to determine not only the width of the "reduced dulness," but the actual size of the heart itself. As I have often insisted, the heart can be mapped out by the practised percussor with considerable accuracy.

The outline thus obtained is precisely that of a successful skiagram, or of the organs themselves when the sternum is raised; it bears therefore strict comparison with other conditions than the normal condition, and also with other individual hearts.

It is essential, too, to remember that no conclusion can be arrived at as to the size of the heart without a determination of the level of its lower border. Whenever that level is much depressed, the distance between the arch of the aorta and the floor of the pericardium being increased, the heart is more vertical, and occupies less space transversely. Whenever, on the other hand, the diaphragm is raised, the heart will no longer hang so vertically, but, having to recline on the centrum tendineum, it will occupy more lateral space between the lungs. Yet its actual size may be identical in both cases. In the one case there will be a wider, in the other a narrower, cardiac dulness.

It is obvious then that the true cardiac significance of variations in the width of the cardiac dulness is a complicated problem not to be solved without a knowledge of the height of the diaphragm at the time of the examination.

It is also obvious that in all conditions in which the ribs collapse, so that the sides of the costal arch approximate and become parallel, and in which the level of the diaphragm descends with that of its costal attachments, the heart must inevitably become more vertical, and the sternal borders of the lungs (when these are free from disease or adhesions) must approach one another.

We have no choice, then, but to admit that in the great variety of states associated with collapse of the base of the thorax the result which must follow, quite irrespective of the original cause, is an encroachment of the pulmonary percussion resonance over the normal precordial

dulness, or, in other words, a diminution in the size of the heart dulness. The abdomen-wasting cancers are but one section of this large group; and the sign in question is not to be attributed to them exclusively, and cannot therefore carry a differential diagnosis.

The precisely opposite configuration of the thoracic base and of the costal arch in the abdomen-distending cancers does not fit in with the mathematics of the question. The arch is opened, the diaphragm is raised, the heart is lying across, the lungs (barring extreme emphysema) are kept asunder, encroaching less, not more, over the normal boundaries of the precordial dulness. If in these cancers also, as alleged, percussion can show a "reduction in the cardiac dulness," we must look for some totally different mechanism for its production in these cases.

The nearest approach at an explanation which I can offer, in order to conciliate paradox with plain sense and the facts of observation with the facts of anatomy, is that taking it first as a general postulate that the effect of chronic wasting disease not involving the lung must be to exercise them with respiration for the relief of the progressive anemia—whilst the latter detracts from their blood supply and tissue nutrition—that in fact they contain relatively more air and less solid and fluid than in full health.

1. The resulting tendency may be for the precordium to lose as a whole a little of its degree of dulness.

2. With regard to the size of the cardiac dulness: (a) in the waist thinning affections it will be demonstrably reduced by direct pulmonary encroachment; (b) in the waist expanding affections it may be encroached upon by some other resonance, in spite of the lungs being pushed away. If the most careful percussion be applied, it will probably be found that the loss suffered by the dull cardiac area is not from side to side, but from below upward; that the encroaching resonance is not pulmonary resonance, but resonance transmitted upward from a distended abdomen. Thus, according to its kind, cancer might tend to reduce the cardiac dulness by reason of general marasmus and atrophy in peripheral cancers; by reason of abdominal atrophy in cancerous stenosis situated high up in the alimentary tract, and lastly by reason of abdominal plethora in cancerous stenosis situated lower down, and in massive cancerous tumefactions of organs.

The Causation of the Presystolic Murmur. Gill¹ explains as follows the occurrence of a rough diastolic murmur and thrill at the apex which led to the diagnosis of mitral stenosis in a case where at the autopsy no mitral stenosis, but great hypertrophy of all parts of the heart, was found. In the 46 cases collected by Phear, in which a presystolic apex murmur was present, but no mitral stenosis, a similar explanation was presumably the case. "The presystolic murmur is chiefly an auricular

¹ Australasian Medical Gazette, March, 1909.

sound, or rather a series of sounds; the murmur is usually compounded of two sounds, muscular and valvular—the first of which is the more important, while the second is not essential. A series of short contractions occur one after the other, culminating in one powerful contraction which occurs immediately before the contraction of the ventricle; and each contraction produces a sound which is conducted by the ventricular muscle to the apex.”

This view, which substitutes the factor of active muscular vibrations for those of the roughened membrane, was suggested to him by the jugular and epigastric tracings from a case of old-standing mitral stenosis. “All the tracings have the same characters, viz., that the ventricular diastole is entirely occupied by a series of small waves, which continue even during the systole of the ventricles. These waves in the jugular can only be due to the contraction of the right auricle.”

Syphilis and Adams-Stokes' Syndrome. Numerous gummata were found by N. Jagic¹ in the septum and in the bundle of His in a man of thirty, who died of heart block after a year of violent fits of palpitation on exertion. The case had furnished no clinical history of syphilis; and it therefore points the lesson of not withholding antisyphilitic treatment from young adults suffering from heart block. Jagic recommends the use of digitalis in attenuated doses, *e. g.*, 0.05 gm. ($\frac{3}{4}$ grain) per day, an amount just capable of stimulating the myocardial fibers without exciting the vagus; he found it of great service in the case reported.

FIBROUS DEGENERATION AND PARTIAL OBLITERATION OF THE BUNDLE OF HIS IN A CASE OF HEART BLOCK IN RHEUMATIC FEVER. Byron Bramwell² regards his case of complete heart block as unique, although cases of slight heart block after rheumatism have been described.³ The patient, aged twenty-nine years, had had six attacks of rheumatic fever since he was fifteen. The chief features of the case were: Very slow pulse; fibrous degeneration of the auriculoventricular bundle of His; a calcareous nodule situated at the right end of the attachment of the anterior mitral flap extending into the septum, and invading and almost completely obliterating the bundle toward its auricular extremity (Fig. 14).



FIG. 14.—Tracing from the apex, showing the infrequent contractions of the left ventricle. The small waves between the large beats are due to the systole of the left auricle.

In spite of morphine and other treatment, the condition grew worse, with anginal pains likened to crushing between two buffers. The pulse

¹ Zeitsch. f. klin. Med., vol. lxvi.

² British Medical Journal, April 24, 1909.

³ Cases XVIII and XXIII, pp. 324 and 339, Mackenzie's Diseases of the Heart.

rate sank to twenty-four and even twenty-two per minute. The patient died six days after his admission, and after the subsidence of the acute rheumatic symptoms.

The two tracings appended are illustrative of the altered relation between the auricular and the ventricular action.

Fig. 15, which is a tracing from the neck, shows both the venous pulse due to contraction of the right auricle and the carotid pulse. The small waves (*a*) in the tracing are chiefly auricular, and are superimposed on the carotid pulse when it appears. The big waves are a combination of the auricular and ventricular (carotid) contractions ($c + a$). The other neck tracings also show the auricular waves. Fig. 16 is a diagram showing more clearly the independent rhythm of the auricle and ventricle.

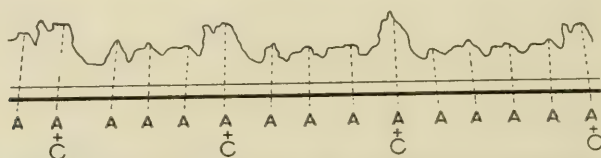


FIG. 15.—Tracing of the movements in the neck due to the carotid and jugular pulses. The small waves (*A*) are due to the auricle, and the large waves ($A + C$) are due to the carotid—an auricular wave in the jugular occurring at the same time as the carotid pulse (see diagram, Fig. 16).



FIG. 16.—Diagram representing the movement shown in Fig. 15. The perpendicular lines in the upper space represent the systoles of the auricle (*As*) as shown by the waves *A*; those in the lower space represent the systoles of the ventricle (*Vs*) as shown by the carotid beats. The relation of the *Vs* to the *As* is constantly varying, showing therefore that the systole of the ventricle occurs independently of the stimulus from the auricle.

Heart Strain and Overstrain, particularly in the young, have acquired prominence by reason of the frequency of the Marathon races. School authorities have been moved to inquire into this most important aspect of athletics.

Theodore Schott, of Nauheim, in a fourth enlarged edition of his pamphlet on overstrain of the heart, has recorded further observations by the aid of *x*-rays and the orthodiagraph, which, in spite of the fallacies apt to beset these methods, confirm the previous conclusions derived from percussion. He shows that the danger of heart strain, originally pointed out by Peacock, is capable of demonstration in the shape of an actual acute dilatation which takes place under stress whenever the symptoms of excessive palpable heart beat and of marked dyspnea are present.

This is a timely warning to all whose cardiac energy is still undeveloped or already exhausted, or who have recently undergone those toxic influences of infective disease to which so much more attention has recently been awarded than to overstrain as a cause of myocarditis, endocarditis, and dilatation,

The Vicious Circles in Clinical Pathology Involving the Heart. J. B. Hurry's¹ recent additions to the interesting instances of *circulus vitiosus* which I reviewed last year are taken from the digestive system.

In *neurasthenia* a vicious circle is soon established between the psychical condition and the digestive functions of the body. Gastric hyperesthesia is frequently met with in these circumstances.

Stomach and Heart. Various circles are set up between the stomach and the heart, often causing the sufferer acute anxiety. A common one is met where worry or insomnia has led to an irregular and weak cardiac action, and hence to congestion and edema of the stomach and intestines. Dyspeptic disorders follow and further depress the heart, a reciprocal relationship being established between them. If the heart is unsound, the disorder is still more readily produced.

Microbic Cyanosis Associated with Gastric Dilatation and Relieved by Laparotomy. George Templeton's² case is of unusual interest from the standpoint of etiology, of diagnosis, and of treatment, and also in connection with the paper on "Microbic Cyanosis," by G. A. Gibson and C. C. Douglass.³ A lady, aged twenty-eight years, of robust constitution, recovering from a short indisposition, while receiving friends, was observed to change suddenly. Her complexion became dusky blue, her lips prune-juice colored, and her extremities cold. Consciousness was retained perfectly and there was no rigidity or twitching. She complained of sharp abdominal pain in the region of the umbilicus, and vomited material which was stated to contain nothing suggestive of blood. The cyanosis increased until the face was almost black, the lids becoming so puffy that her eyes were obscured, the lips were turgid, and the nose assumed a flat negro-like appearance. There was no difficulty of breathing, but as time progressed she complained of severe pain across the upper part of the abdomen. A careful examination of the heart was made, and neither dilatation nor bruit could be detected. After consultation the abdomen was opened for purposes of diagnosis and, if need be, treatment. Immediately profuse bleeding took place from the incision; the tense anterior wall of the stomach presented, and coursing over its surface numerous engorged vessels were observed. The duodenum was free from perforation or ulcer. The stomach was not opened, but the extreme congestion of its walls became considerably less, and the organ, becoming rapidly reduced in size, was without diffi-

¹ Lancet, 1908, vol. ii, p. 1514.

² Ibid., March 13, 1909, p. 762.

³ Ibid., July 14, 1906.

culty returned within the abdomen and the wound closed. The distress which preceded operation was relieved and steady progress was made to recovery. The benefit attending the operation was attributed to the copious hemorrhage.

Dr. Leonard Guthrie, who was called into consultation, remarked that the first impression conveyed was that of acute dilatation of the heart. But neither the physical signs nor the symptoms went to confirm that view. There was no increase in cardiac dulness, no venous pulsation, no bruit, and, in fact, no signs of dilatation. The pulse was regular and of good volume, only somewhat frequent. The patient was not dyspneic, and turning over in bed did not cause her to be breathless. The voice was not altered, and there was no difficulty in swallowing. The most probable cause was some form of toxemia; and there was a possibility that the patient might have been taking a member of the coal-tar group, such as phenacetin. When that class of drugs first came into use, there occurred a number of cases of toxemia, and some are still met with. As the patient had been considerably upset by family bereavement, it was not unlikely that she might have been suffering from headaches and might have been taking antipyrine or some similar remedy.

The next possible cause of the cyanosis was some toxemia converting oxyhemoglobin into methemoglobin. Several cases have been recorded in Germany, usually associated with chronic intestinal complaints, and with diarrhea; and in all of them the spectroscope showed methemoglobinuria. It seemed probable that there had been some microbic agent at work, as in a case described by Gibson and Douglass, that of a lady, who recovered, after being cyanotic for many months, and where blood revealed the presence of a bacillus which resembled the colon bacillus. Perhaps venesection might have done as much good as laparotomy.

Medical Gymnastics for Myocardial Disease are recommended by R. H. Babcock¹ in cases of early incompetence without valvular disease. It is not surprising that the best results are witnessed in the earliest cases. The methods suggested are of undoubted value where the structural changes and the symptoms of myocardial degeneration are only threatened or simulated rather than enacted.

A reduction in the size of the heart can be brought about by exercising the limbs in the recumbent posture. F. Moritz² has verified this result by orthodiagraphy even in some cases of pathological dilatation. He is in favor of cautiously applying this method in the treatment of some heart affections.

Schücking³ also testifies to the value of the recumbent exercising method after major operations as well as in anemia, and for all par-turients. His results have been uniformly good and rapid.

¹ American Journal of the Medical Sciences, January, 1909.

² Münch. med. Woch., April 7, 1908.

³ Zentralblatt f. Gynäkologie, December 19, 1908.

The Application of Heat in Pulmonary and Cardiac Affections is urged by A. Heermann¹ on the strength of the excellent results obtained in a series of 100 cases. In cyanosis whether of pulmonary or of cardiac origin (*e. g.*, in pneumonia or in heart disease) the hot air bath limited to the lower part of the body relieves the intrathoracic congestion in a striking manner, quite irrespective of the occurrence of sweating, which is not specially aimed at. Locally the application of heat is of signal service; and he has now made it a rule to apply a hot-water bottle to the heart once or twice daily for periods of ten to forty-five minutes, in all rheumatic affections, in preference to the ice-bag, because of its freedom from ill effects, and of the comfort experienced by the patients. Heat should be tried first. At the same time there are cases in which the ice-bag may be found to afford greater relief.

It may be mentioned that K. A. Hasselbach and H. Jacobaeus² have published successful results from the treatment of angina pectoris by means of strong arc light baths.

Tachycardia. Helpful devices to arrest attacks of tachycardia are mentioned in R. Balint and K. Engel's³ report of four cases of this affection. Though the physician fails, the patient may sometimes discover a successful maneuver for the relief of his paroxysms, but not for the liability to their recurrence. One of these patients was sometimes able to arrest the attacks by seizing the back of his neck in both hands and throwing his head back; another by abruptly sitting up. Another aborted the attack by large doses of bromides in the prodromal stage.

Voluntary Eructation for the Relief of Paroxysms of Angina and of Tachycardia is a method which Max Herz,⁴ of Vienna, has copied from Nature.

The symptoms are immediately mitigated if the patient can succeed in belching. This may be brought about by the following device: A sip of water is held in the mouth until the head is thrown well back. In that position the act of swallowing produces a peculiar pharyngeal sensation followed by a reflex eructation. The patient's chief difficulty is to overcome the inopportune dictates of his code of good manners. The method is not only curative, but may prevent an attack if resorted to in time.

Cardiolysis for Pericardial Adhesions. A successful case was exhibited before the Royal Society of Medicine, in May, 1909, by Poynton and Trotter. The adhesions were not interfered with, and the periosteum was left behind. In a total of 17 cases reported in the literature for 1908, not one fatal result had been recorded. Alexander Morison

¹ Deutsche med. Woch., March 25, 1909.

² Berliner klin. Woch., September 30, 1907.

³ Zeitschrift f. klin. Med., May 9, 1908.

⁴ Semaine Médicale, June 3, 1908.

referred to three cases of his own. In one of them the periosteum had been removed and the rib had been entirely renewed. In another case the patient although much relieved had died later from a fresh attack of pericarditis.

A Resuscitation Technique, if any efficient one could be found, should be kept always immediately available. The latest method is that evolved after experimentation on animals by G. W. Crile,¹ who recommends that its technique should be practised beforehand. The patient is placed prone, and rapid rhythmic pressure is applied with the hands on either side of the sternum. Arterial infusion is meanwhile practised, through funnel and rubber tubing, with normal saline, Ringer's or Locke's solution, or, in their absence, sterile water. The point of the cannula is inserted into the artery toward the heart. As soon as the flow is established from fifteen to thirty minims of a 1 to 1000 adrenalin solution, to be repeated in a few minutes, are injected by puncturing the india rubber; and at the same time the rhythmic pressure is brought up to a maximum to distribute the fluid to the arteries. As soon as the coronary pressure has risen to 40 mm. the heart is likely to start beating; this is the signal for removing the cannula. There are many reasons which recommend this method and justify its insertion in these pages.

How Much Fluid does the Body Require? is the pertinent question asked by Alexander Haig,² and his answer is, "30 ounces to be aimed at, instead of 50 ounces." The question is one of hydrostatics and of hydrodynamics, and therefore of the circulation. Hence it is not surprising that Sir James Barr³ should be preaching the same text in a lecture on the "Treatment of Diseases of the Heart," a text elaborated in Oertel's "Therapeutics of Circulatory Derangements" and referred to in Sir James Barr's own paper.

Oertel's theoretical indications for the restoration of the hydrostatic balance which is deranged in cardiac failure are: Diminution of the blood volume, with increase of its albumin and general improvement; reduction of the cardiac fat and strengthening of the cardiac muscle; equalization of the arterial and venous systems; unloading of the kidneys and removal of their chronic hyperemia and inflammation; unloading of the pulmonary vessels (checking the hyperplasia of the interstitial connective tissue, reducing the ectatic alveolar capillary network, and increasing the breathing space); finally, removal of the fat deposited in the subcutaneous tissue and in the thoracic and abdominal cavities, and overcoming the tendency to excessive fat formation generally.

He effects his object by increasing the excretion and limiting the supply so that the excess accumulated will be gradually got rid of by the lungs and skin, which he stimulates to active excretion by the hot

¹ American Journal of the Medical Sciences, April, 1909.

² British Medical Journal, April 24, 1908.

³ Ibid.

air bath, and especially by mountain climbing. He reduces to a minimum the fluids, while a diet rich in proteids makes up for the continued loss by albuminuria and facilitates the rapid combustion of the stored-up fat.

This dominant circulatory aspect of the question is also largely elaborated by Haig particularly in the direction of blood pressure. But he shows that it is by no means the only aspect. As a result of such malnutrition and debility, excess of fluid will eventually produce some edema of the ankles, which is not infrequently accompanied by edema of the cortical membranes, which lies at the root of brain fag and debility, commonly called "nerves;" of bad temper, nervous excitement, hysteria, or of neurasthenia, depression, and lethargy up to the more fully developed signs of uremia—for example, twitching of muscles, headache, and coma. Many of these conditions are often promptly relieved, and may be cured by lessening fluids, strengthening the heart, and later on removing collemia by a purin-free diet. He believes that no small part of the increase of such "nerve" troubles is due to increased consumption of fluids, especially where the increase of fluid is not accompanied by any measures to diminish the introduction of uric acid. As a rule, collemic sufferers dislike fluids. Their blood contains excess of fluid, and shows only a small percentage of hemoglobin and cells, since the capillaries of all the organs of excretion (kidneys, skin, lungs) are blocked by collemia. He wrote in 1903, on the "washing-out plan," mentioning a number of cases in which an attempt to wash out an excess of uric acid had been quite unsuccessful, because uric acid controls the passage of water out of the body, while the water does not, to any important extent, control the excretion of uric acid. Sir Andrew Clark's teaching was to reduce fluid in cases of *morbus cordis*. This does not seem to induce urinary gravel in those who had not previously had gravel. In headache, epilepsy, and depression, by lessening the fluids, Haig could lower the blood pressure 20 or 30 mm. of mercury, this often sufficing to turn the balance.

Calcium in the Treatment of Diseases of the Heart. Under the heading of medicinal remedies in cardiac affections, Sir James Barr¹ awards a very prominent place to the clinical therapeutics of the calcium salts, but he would probably not consider that the views which he expresses are based upon mathematical certainty. There must be room for considerable improvement in our views on all these points. Milk may be harmful in various affections if not judiciously administered, although an exclusive milk diet is of the greatest service in disease of the aorta as well as of the heart. When we consider how much of lime salts is ingested day by day, by entire populations, whose water supply is highly calcareous, and their indemnity from the worst consequences

¹ British Medical Journal, April 24, 1908.

alleged, we are inclined to attribute a great deal more clinical importance to the function of calcium in clotting the milk than to its action in coagulating the blood.

THE BLOODVESSELS.

Arteriosclerosis. There are other forms of arterial disease besides the arteriosclerotic variety, with its local proliferations, sedimentations, necrosis, and incrustations. This is plainly suggested by the findings of Scheel,¹ who measured the diameter and length of the aorta and pulmonary arteries in 500 cadavers classified according to age, etc. The constantly diminishing elasticity and the widening of the vessels with age, favor arteriosclerosis. The etiology of arteriosclerosis needs revision. An abnormally wide aorta should not be passed as free from disease because no arteriosclerotic patches are evident.

THE ETIOLOGY OF AORTIC DEGENERATIVE CHANGES is also fully discussed by G. Newton Pitt² and others, and we derive the conclusion that an "open and comprehensive mind" must be kept by the clinical pathologist, so great are the uncertainties and contradictions as to the various causes alleged. Local causes probably combine with individual peculiarity in favoring the incidence of any of the dangerous infections or the effects of drugs (adrenalin, barium, digitalis, tobacco, etc.). Climate and race (Brunton) would influence blood pressure—lowering it in India, and raising it in Canada. But Osler demurs to the latter statement, and claims for Canada a lower blood pressure than that in Britain. Newton Pitt stated that aneurysm was much more common in herbivora than in carnivora, a fact with some bearing on the influence of nitrogenous diet, though the chief cause in herbivora was the presence of parasites. The chief lesson we learn is that when once a spot of aortic damage occurs, that spot becomes vulnerable to infection and high pressure should be avoided.

THE FACTORS OF ARTERIOSCLEROSIS, as stated by G. Oliver, are various, and they vary in their actual predominance in the individual. Moreover, besides the causes themselves there are varying predisposing factors, such as the individual proclivities, hereditary and trophic.

The leading causes in the majority of cases are: (a) Persistent supernormal arterial pressure, however induced, and (b) toxins of various kinds, either generated within the body (endogenetic) or introduced from without (exogenetic). To these pathology must add another group, (c) that of mechanical lesions, as it has been established that arteriosclerosis can be produced in the lower animals by simply compressing the abdominal aorta for one minute once or twice a day for a

¹ Journal of the American Medical Association, October 19, 1907.

² Lancet, 1908, vol. ii, p. 383.

comparatively short period. The changes consist in a drawing out of the elastic fibers and degeneration of the muscular coat, plaques of calcareous material being formed. W. E. Dixon in referring to these results regards them as possible also in man from violent exercise, and more especially in mature years, from high pressure.

As a comment, it may be suggested that while constructed to sustain the systolic pressures of muscular work and strain, the aorta may be the most sensitive of all arteries to any direct pressure from without, differing from the arteries of the limbs, which are constantly exposed to strong compression, in the fact that it is most jealously guarded by soft and yielding surroundings in front, and firmly supported on the smooth level of the vertebræ behind. It may be prepared to bear the strongest waves of systolic pressure when duly eased by the elasticity of the entire arterium of the body, but not that enormously raised pressure due to obliteration which is rendered continuous and banging by the shutting off of the greater part of the elastic expanse of the arterial system.

As regards the *pressor effects of nicotine*, Dixon suggests that the liver probably looks after the safety of the inveterate smoker. In comparing the sudden high rise in the young non-smoker, after his first cigar, with the slight rise in the moderate smoker, and the absence of effect in the habitual smoker, he hints at the possibility that man may produce a ferment, probably in his liver, which counteracts the effects of nicotine.

THE TREATMENT OF THE PAINS OF ARTERIOSCLEROSIS is a wide and varied subject fully dealt with by Goldscheider.¹ Arteriosclerosis may be entirely silent, or it may give rise to various abnormal sensations—or again to more or less severe pain. Some of the principal kinds of the latter may be enumerated, as aneurysmal pain, anginal pain, dysbasia pain, arteriosclerotic headache, arteriosclerotic colic, and arteriosclerotic neuralgia in the limbs.

It is essential to include within the scope of therapeutic discussion various discomforts, distresses, and miseries which may not amount even to the milder pains of arteriosclerosis, but may yet have an etiological significance comparable to that of the agony of angina. Peculiar sensations in head, chest, stomach, or limbs, and various uncomfortable complications connected with irregularities in the organic functions, chiefly cardiac, gastric, and intestinal, are also to be kept well in view.

A practical basis is supplied to us by the fact that the two main types of pain, namely, pain in the neuromuscular district supplied by the diseased artery, and pain in the arterial wall itself, are both developments of an antecedent latent hyperesthesia induced by irritation. It is clear that our treatment will have to be laid down along two lines, one of them making for the arteriosclerosis, the other for the inborn or acquired irritability of the nervous system.

¹ Zeitschrift f. Physik u. Diät. Therap., April, 1909.

The first indication is rest and the avoidance of irritation, particularly in its baneful association with ischemia. Bodily rest is essential, amounting in bad cases to a genuine rest cure, with due provision for fresh air. Some patients insist, even sometimes an aneurysmal patient, that plenty of movement suits them—such is human fallibility. But we should be careful to avoid the varieties of general or balnear treatment involving any strain.

Psychical tranquillity is another important consideration. Emotion is a fertile source of anginal attacks, including the abdominal form. The very thought of the trouble may bring on an attack. Part of the responsibility for this awful dread rests with the perhaps too extreme pessimism sometimes entertained and expressed by the medical profession.

Climatic influences need to be carefully studied in dealing with the factor of irritability.

Lastly, diet obviously occupies a most important place in the quieting plan.

The treatment of the arterial disease consists essentially in subduing the tendency to excessive irritations and to excessive stresses by dietetic and other measures.

Restrictions must be enforced in the amount of meat, of salt, and of condiments, and total abstinence in respect of alcohol, tea and coffee, and tobacco. As regards limitation in alimentation, it is surprising how much benefit and conscious improvement results for the arteriosclerotic patient from its reduction to a minimum when this can be carried out in spite of the clamor of anxious friends for more and more "support." Indeed, the supporting plan is frankly favored by a section of the profession itself as the proper treatment for all cases of nervous depression. But in reality there is no better cure than Huchard's milk diet, and part of its excellence may lie in dechloridation.

The scrupulous avoidance of all detrimental influences which the patient's usual mode of life and occupation may entail, particularly in the direction of an increased blood pressure, is too obvious a duty to need dwelling upon. Yet it is a great part of treatment.

The climatic indication is important not only as regards the avoidance of the northern winter, but as a genuine factor of improvement. Special mention is made of the value of the air of the altitude in arteriosclerosis. Balneologically, too, there is much to be done by the appropriate use of simple thermal baths or "Wildbads," effervescing thermal baths, and guarded general hydrotherapy. Goldscheider lays great stress upon the value of frictional hot and cold water rubbings. The frequent use of warm baths is good for the skin and for the arterial wall, and particularly for the kidney where some inadequacy may be suspected long before the appearance of casts or albuminuria. Diaphoresis is for the same reason of great service, and to be cultivated. Mild cold

water therapy (so long as no contra-indications exist, and at a moderate degree of temperature) is decidedly indicated as well as "air baths." But vasomotor training measures, such as cold affusions and douches, are suitable only for the earlier stages and so-called presclerosis.

Exercise, which is a preventive, is also a curative agent, provided it be carefully measured to the requirements of the case; and for that purpose Swedish gymnastics and massage are of great value, particularly as subserving the primary indication of free intestinal action. In brief, the line of treatment is that of an improved nutritional hygiene, in which the moral effect of cheerfulness is no mean contributory factor.

Medicinally, in addition to any incidental requirements that may arise, Goldscheider has nothing better to recommend than the preparations of iodine, of which iodide of potassium is the best.

INTERMITTENT CLAUDICATION, even when it belies its name and is itself practically permanent and due to a permanent arterial narrowing, is not altogether beyond the scope of our efforts. It calls for a more intensive internal medication by iodide of sodium (2 to 3 grams, 30 to 45 grs. daily) or by sajodin and the like combined with diuretin of salts of caffeine, and supplemented by hot baths or sitz baths and hot spongings, and alternating fractional rubbings, to circulate a better blood supply through the lower limbs, and by passive movements, massage and galvanism. Above all, Goldscheider insists on the importance of pain on movement. The pain tells us that nerve and muscle are being damaged, and that rest is their urgent requirement. He also indorses Erb's teaching as to the evils of nicotine and of alcohol, and of any extremes of heat and cold in the local balnear treatment of the feet and legs. He also indorses Erb's recommendation of warm foot baths and of the galvanic foot bath (12 to 20 milliampères), into which he dips the cathode while the anode is placed over the popliteal nerve or sacral plexus.

ANGINA PECTORIS claims the same measures of relief for the hyper-esthetic factor, only in a yet higher degree. The management of the attack itself is conceived on the old lines. Injections of morphine or caffeine (the sodium benzoate of caffeine in doses of 3 to $7\frac{1}{2}$ gr.), and when the pulse is weak and uncertain, of digalen and of camphor. Nitroglycerin is very uncertain, and should be replaced by erythrol tetranitrate as a substitute. Topically warm foot baths and arm baths are also to be recommended.

The treatment of the interval is based primarily upon the avoidance of all circulatory obstructives. This includes the relief from the straining of constipation and from that impeded intestinal circulation to which Zuntz attributes the failure of reabsorption of the intestinal gases. There is much point therefore in skilled Swedish massage of the abdomen. The same end is also aimed at in the Swedish gymnastics and lighter forms of general exercise, absolute rest not being desirable

except on the days of attacks or of bad symptoms. Frequent deep breathing is also useful, but the breath should not be held. The same principles of hydrotherapy are indicated as have been described above, and, in addition, the thermophore, or some systematic warm application over the precordium, may be serviceable. If there should be any ischemic headache, similar local treatment may be used, including hot compresses and bathings for the forehead, low posture of the head, and perhaps Bier's treatment by means of a frontal elastic band.

D'Arsonval's high-tension current has not yielded any appreciable result in Goldscheider's experience in angina, although apparently active against "vascular" pain. Strangely, he has little to say in connection with drug treatment, and that is restricted to a mention of diuretin and of small doses of nitroglycerin as tentative agents.

VASOCONSTRICTION AND VASODILATATION. In this department there is nothing very new to report as regards the drug treatment. But there is always much in the clinical management of cases that suggests fresh departures. Sir Lauder Brunton's views are well known. He keeps the pressure down by sodium nitrite thrice daily, and by saline and mercurial aperients and iodide of potassium.

Very practical views are given in Le Fevre's¹ paper on pathological high and low blood pressure. There are three stages of changes in high arterial pressure: (1) Hypertonicity of the muscular coats of capillaries and arterioles; (2) progressive hypertrophy of the muscular tissues of the cardiovascular system; (3) diminished muscular control on account of progressive fibrosis, causing obstruction of vessels. Treatment must recognize that hypertrophy is not confined to the heart, but extends to the whole vascular system. Only the first stage is curable. All causes of irritability in the daily life must be sought for and removed, such as tobacco, alcohol, improper and excessive food, etc., and suitable medical treatment applied to increase the activity of the emunctories. In the second stage, hypertrophy is a conservative condition not to be reduced unduly, but only controlled. Habitual excess in proteids may produce hypersensitiveness of the nervous system and reflex high tension. Other reflexes act in the same way. The general conditions affecting the kidney and kidney disease must be distinguished. When the kidney is diseased, high pressure is necessary. Large amounts of water should not be used as a diuretic, as they increase the work of the heart. Vasomotor dilators will relieve many symptoms. Used too freely they are dangerous. Sedatives should be used only when cardiac overaction occurs under excitement. Baths are most useful. Cold baths raise arterial tension and hot baths reduce it. Lastly, massage may be used either to raise or to lower pressure, according to the movements used.

¹ Medical Record, April 25, 1908.

Treatment by High-frequency Currents. Concerning the beneficial effect produced in high arterial tension by high-frequency currents, G. Lemoine¹ bore witness before the Académie de Médecine to the correctness of Moutier's observations.

Microsphygmia is a new name applied to a condition, noticed hitherto chiefly in idiots, of permanent spasmodic narrowing of the arterial caliber, variable in different arteries, and varying with changes of temperature. It was originally described by Variot² in 1898 and subsequently by Gastou and Emery in association with idiocy and ichthyosis, with inherited syphilis and ichthyosis, and with infantilism without any ichthyosis. Richet and Girons have found 16 similar cases among the 234 juvenile inmates of the Fondation Vallée, and they state that the conjunction of idiocy with microsphygmia is a constant feature, but that ichthyosis is not a constant accompaniment of the vascular peculiarity. They classify their cases into three groups, the first in which the pulse is feeble but is always perceptible, the second in which it can never be felt, and the third in which it is only felt under certain conditions.

Jugular Pulse Associated with Pulsus Bigeminus. E. E. Laslett's³ report acquires additional interest from the diagram which James Mackenzie has appended to the tracings, as this shows the explanatory nature of his graphic method. The patient, a painter, aged forty years, was suffering from terminal symptoms of broken compensation in aortic valvular disease. The pulse condition to be described lasted continuously for six days preceding that of his death. It is seen from the tracings of the jugular and radial pulse that at the extra beats which are the cause of the bigeminal rhythm, the auricles contracted during the ventricular systole, and there is one large wave synchronous with the extra beat in the radial artery. The increased size of this wave is due, as Mackenzie has pointed out, to the fact that the right auricle is unable to empty itself into the contracted ventricle, and therefore a larger quantity of blood than usual is sent into the jugular veins. In this tracing the unusual feature is that the combined wave commences distinctly beyond the middle line, that is, nearer to the post-extrasystolic auricular wave than to the pre-extrasystolic.

Mackenzie divides extrasystoles into three types—auricular, ventricular, and nodal—the ventricular including the rare form of interpolated extrasystole, and suggests that the probable origin of the extra stimulus lies somewhere in the remains of the primitive cardiac tube, in auricle, ventricular bundle, or auriculoventricular node. In the nodal extrasystole, the auricles and ventricles contract together, or nearly so, and usually prematurely. It may, however, happen that

¹ Semaine Médicale, 1904, 1905, and 1907.

² Revue de Médecine, November 10, 1908; Lancet, 1909, vol. i, p. 777.

³ British Medical Journal, April 24, 1909.

the combined wave appears at the normal period of auricular contraction, and it may then be difficult to determine whether the extrasystole is of nodal or ventricular origin. In the present instance, from the regularity and persistence of the bigeminal character, and the fact that the auricular wave is always synchronous with the ventricular, it is probable that the extrasystoles are of nodal origin. Although there is no time record in the tracing, it may be taken as certain that the *a* to *c* interval is increased. In an earlier tracing, in which the combined wave was nearer the middle point, the *a* to *c* interval was less. The increase of the *a* to *c* interval is no doubt due to the incomplete restoration of conductivity as a result of the short period between the extrasystole and the following normal auricular beat.

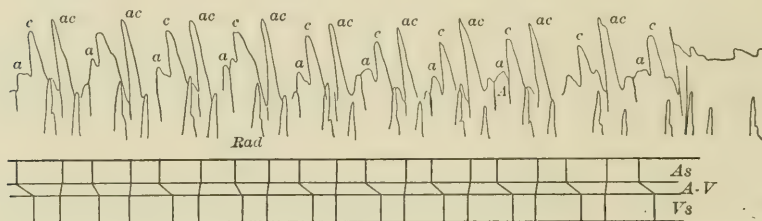


FIG. 17.—The figure shows the character of the jugular pulse associated with the bigeminal rhythm in the radial pulse. The appended diagram explains the nature of the events. *As*, signifies auricular systoles; *Vs*, ventricular systoles; and *A-V*, the conduction between auricle and ventricle.

Laslett is unable to explain this peculiar rhythm. The alternate auricular contractions failed to appear at the normal period, but whether the sinus rhythm remained regular or not and whether the heart in the final stage became continuously irregular (nodal rhythm), remains uncertain.

The Arterial Wall and Blood Pressure Readings. A full account was given in *PROGRESSIVE MEDICINE* for last year¹ of the fallacies of instrumentally recorded pressures. William Russell² maintains that these pressures have to be variously discounted according to the varying resistance of the arterial wall in different states of contraction or of relaxation, and above all, that the arterial wall when much thickened by disease can account for an important fraction of the pressure apt to be attributed to the blood column within it. These views have met with a great deal of criticism particularly on the part of Leonard Hill, and some sharp passages of arms have taken place in the columns of the medical press.

O. K. Williamson's³ paper provides them with a good deal of support,

¹ September, 1908, pp. 92 and 95.

² *Arterial Hypertonus, Sclerosis and Blood Pressure*, London, 1907.

³ *Royal Society of Medicine*, April 27, 1909.

and also afforded an opportunity for some important evidence obtained by W. P. Herringham. The latter has been lately experimenting with arteries removed and kept for three days in a solution of sodium fluoride, and found that they, in many instances, gave high readings that were apparently due to the arterial wall. Also that in the same patient the leg arteries gave much higher readings than those of the arm. Also differences observed during life between the readings of the arm and leg were confirmed in the arteries after death. T. D. Savill also referred to the greater change in the leg arteries of old people as compared with those of the arm, but thought the vital factor an all-important one, whilst Leonard Hill questioned whether the differences between the arm and leg readings might not be due to error in instrumentation or the influence of muscular contraction. The readings in arm and leg should be taken simultaneously, and with the muscles relaxed, to be dependable. There was also obvious fitness in C. O. Hawthorne's remarks on the factor of variability of the strength of the cardiac systoles in producing variation in readings and on the importance of comparing the blood pressure reading with sphygmograms.

Williamson's observations, made by the method of circular compression with Oliver's compressed-air hemomanometer and 2 cm. armlet, showed that the resistance due to the arterial wall might markedly influence the readings. They were conducted on the leg and arm of each patient in 21 cases of high arterial blood pressure. In all these cases in which the arteries of the leg and foot could be felt these were found to be abnormally resistant, and more so than those of the upper extremity; and in nearly all the cases there was also marked thickening in the arteries of the upper extremity. Ten cases of normal or low blood pressure, in which the arteries presented no clinical evidence of disease, were investigated in the same manner, so as to afford a basis of comparison. The observations were made on the calf and arm, the patient observed being recumbent, and the part of the limb on which the observation was made at the level of the heart.

The following results were arrived at:

1. In the high blood pressure cases the leg systolic readings were in nearly all cases markedly higher than the corresponding arm readings (average difference 32 mm.), and the cases of highest blood pressure yielded distinctly greater differences than the cases of somewhat lower blood pressure. On the other hand, the leg diastolic readings in these cases were, on the average, practically identical with the arm diastolic readings (average difference less than 2 mm. Hg.).

2. In the case of normal or low blood pressure, the systolic arm and leg readings were found, on the average, to be identical (average difference less than 2 mm. Hg.).

3. Inasmuch as the blood pressure in the leg could not be higher than that in the arm (either limb being at the level of the heart), and

seeing that the influence of the tissue superficial to the artery might (when a sufficiently wide armlet was used) be neglected, it necessarily followed that the difference between the arm and leg readings could only be due to resistance of the arterial wall.

4. The conclusion that the abnormal condition of the arterial wall was a direct result of the increased blood pressure would seem to be inevitable, for the only obvious difference between the conditions to which the arteries of the legs and those to which the arteries of the arms were exposed in daily life was that, owing to the action of gravity, the former were subjected to greater hydrostatic pressure from a higher column of blood than were the latter.

Practical conclusions of great importance will have to be drawn from these facts. They were already foreshadowed by Russell's statement that we must train the finger to estimate the pressure within the artery, and much earlier still in my work on *Pulse Sensations and Tactile Sphygmology* (London, 1894).

THE RESISTANCE OF ARTERIES TO EXTERNAL PRESSURE. From their experiments on arteries from dead bodies, Herringham and Womack,¹ conclude that when using the sphygmomanometer it must be borne in mind that the resistance of the wall of the brachial artery varies from 4 mm. to 34 mm. Hg.; that the reading of the instrument represents the sum of the blood pressure together with the resistance of the artery; and that there is as yet no clue which would permit of an analysis of this total into its two component parts.

Leonard Hill referred to experiments he had carried out with Flack on the arteries of the living human subject. Arteries removed from the body and slightly irritated contract enormously and persistently; on the other hand, freezing causes extreme relaxation; thus, observations on postmortem arteries are inconclusive. His experiments went to show that the arterial wall was a negligible factor, even in the presence of arterial degeneration. W. Oliver spoke of the great variation in texture of normal living arteries, and of the change in the compressibility of any artery during its different stages. Sir Lauder Brunton stated that by an experiment of his own it was demonstrated that arterial compressibility was only 10 millimeters of mercury above that of the fluid inside the vessel. Differences in rigor mortis might explain differences in readings, but he was certain that alterations in the contraction of an artery along its course occurred during life. He took the pressure in the two arms at the same time, and accepted the lowest pressure as probably very near the correct one. Lockhart Mummery said that he had compared the sphygmomanometric reading with the actual monometric arterial pressure in the opened vessel; the readings showed no greater difference than 2 mm. Hg., and no variation caused by the

¹ Royal Soc. of Med., November 24, 1908.

arterial wall could be detected. Sir Clifford Allbutt's impression was that arterial coats had very little influence on the register of blood pressures.

Further criticisms are embodied in Leonard Hill and Martin Flack's¹ paper on "The Method of Measuring the Systolic Pressure in Man, and the Accuracy of this Method," with a description of Hill's new simplified pocket sphygmometer made by Hicks of Hatton Garden, E. C.

The accuracy of the obliteration method in man is established in the two following ways:

1. *The Gravity Method.* It has been proved by Mummery and also by Hill that the obliteration pressure in the femoral of the dog is the same (within 1 or 2 mm. Hg.) as the systolic pressure taken in the opposite femoral with a cannula and Hurthle manometer. It has been proved further by Hill that in a dog placed in a vertical posture, head upward, the pressure in the femoral artery is higher than in the carotid by the hydrostatic pressure of the column of blood which separates the two points of measurement, while if the dog is turned head downward it is higher in the carotid than in the femoral by the same column of blood. The pressures were measured directly with cannulae and mercury manometers. Similar observations on man with the aid of two armlets and two mercurial manometers gave like results. The contraction of normal arteries varies with the pressure they have to support and with the control of the vasomotor nerves, and both factors are modified very greatly by change of posture, while in the case of sclerosed arteries it is unlikely that any two of them would be degenerated and stiffened to a like extent.

Interesting experiments were performed on students with one armlet round the upper arm and another round the calf of the leg.

"We took the readings with the student (1) lying supine in the horizontal posture; (2) standing with the observed leg relaxed and the weight thrown on the other leg; (3) lying supine with the legs raised into the L-shaped position; (4) hoisted up by rope and pulley into the vertical head-down posture, the rope being attached round the foot of the leg which was not observed, and the observed leg attached to this leg by a bandage, so that the posterior tibial artery could be felt at the ankle.

Considering the difficulties, the agreement of the calculated and observed differences is astonishingly near. A most interesting point in these observations is the indication that while the pressure which the heart has to overcome does not alter greatly, the pressure in the cerebral arteries is kept approximately the same in the horizontal, standing, and vertical head-down postures, in spite of the enormous differences in the effect of gravity.

¹ British Medical Journal, January 30, 1909.

Subject.	Posture.	Brachial artery. Pressure in mm. Hg.	Posterior tibial artery. Pressure in mm. Hg.	Difference in mm. Hg.	Height of column separating armlets in cm.	Difference calculated from height of column in mm. Hg.
H. H. R.	Horizontal	140	138	2		
	Standing	136	204	68	89	68.5
	L posture, legs up	122	76	46	60	46.1
	Vertical, head down	148	70	78	1010*	77.7 ¹
P. H. R.	Horizontal	126	126			
	Standing	140	204	64	86	66.1
	L posture, legs up	132	78	54	65	50.0
	Vertical, head down	116	42	74	91*	70.0 ¹

In the case of patients with high arterial pressure, the gravity method was applied to the two brachials, one arm being held up and the other down, and the pressure read in two armlets at the same time.

In one case of aneurysm, the systolic pressure varied so much with successive beats that no good readings could be obtained.

Case.	Difference in height measured equal to mm. in Hg.	Difference in pressure observed.	Arterial pressure.
Sclerosis, anginal pain, emphysema	17.0	17.5	140
Chronic nephritis, thick arteries	10.0	10.0	185
Diabetes, small contracted arteries	15.2	15.0	175
Chronic nephritis, arteriosclerosis	11.6	12.0	197
Paraplegia	11.55	11.0	175

Many experiments on healthy subjects gave the calculated reading within 0.2 mm. Hg.

2. The second method seems to prove with certainty the accuracy of the obliteration method. Up to now it has been tried in only a few cases, but its trial is recommended to those who wish to test the matter further on cases where readings are high and arteries thickened. "We place one armlet round the brachial and another narrower one round the forearm of the same arm. We find the obliteration pressure with the first armlet. Suppose it is 150 mm. Hg. We lower the pressure in this armlet to say 145 mm. Hg., so that the arterial blood can get through into the limb, but cannot get out of the veins of the limb until the pressure in the veins rises above 145 mm. Hg.

Allowing sufficient time for the veins to fill, we then measure the pressure in one of the superficial veins, and find that it does finally reach this pressure. As the venous pressure is found by the second armlet to be 145 mm. Hg. and equal to the pressure in the first armlet, and

¹ The arm was not in quite the same position in regard to the heart level as in the standing posture. It had sunk headward, so that the column of blood separating the two points of measurement was longer.

as the pressure in this is within 5 mm. Hg. of the obliteration pressure, the latter is proved to be correct within 5 mm. Hg."

THE DIASTOLIC BLOOD PRESSURE. The long sought means of determining this pressure is believed by Ehrat¹ to be now available with the help of the ordinary apparatus (cuff and manometer). While we are gradually increasing the pressure the finger is kept applied to the ulnar artery just below the edge of the cuff. Quite suddenly the pulse will undergo "an abrupt, almost violent, change," which seems to shake the surrounding surface for some distance, and this shake is to be felt by the finger in the region of the artery even when owing to subcutaneous fat the artery itself cannot be felt. From that moment the pulse waves assume a hard, sudden, and lightning pulsation.

By watching the gauge it is found that the pressure in the cuff at that moment (which is found to be the same for all observers) exactly corresponds (with due allowance for the oscillations of inertia) to the diastolic pressure as indicated by the oscillations. He regards the phenomenon as the sign of a first arterial wall collapse occurring locally under the grip of the cuff.

A Universal Sphygmomanometer. The instrument is used by Janowsky,² of St. Petersburg, to determine the blood pressure in the upper extremities by comparing the findings of five different instruments, viz., the Riva-Rocci cuff, the tonometer, the two spring manometers of Basch, and the water manometer of Ziplitaef-Janowsky, all combined in one single apparatus worked with one and the same mercury manometer.

A Pocket Sphygmometer has been devised by Leonard Hill which represents the opposite extreme of instrumental simplicity (Figs. 18 and 19).

The instrument consists of a gauge and of a flaccid rubber ball contained in a silk bag, and fitted with an inch of rubber tubing. The gauge consists of a straight glass tube, which is carried, when not in use, in a metal case like that of a clinical thermometer. A fluid meniscus is introduced within the gauge by placing its open end in water.

When connected to the gauge, the ball is covered by the palm of one hand and pressed down upon the radial artery of the patient whose arm must be supported in a suitable position, while the radial pulse is felt by the fingers of the other hand placed peripherally to the rubber ball. The pressure indicated by the gauge is read when the radial pulse is obliterated. The gauge is empirically graduated in millimeters of mercury.

The advantages claimed are: (1) Simplicity and accuracy. The

¹ Münch. med. Woch., March 25, 1909.

² Journal of the American Medical Association, December 12, 1908; Mitthn. der Gesellschaft f. innere Med., vii, p. 202, 1908.

gauge cannot alter or go wrong; the fluid meniscus is easily set at zero. The silk cover prevents overexpansion of the rubber-ball. (2) Convenience in use. The instrument is applied to the wrist and the patient's arm need not be stripped; the discomfort of the armlet is avoided. (3) Portability. The gauge and rubber-ball can go into a waistcoat pocket.

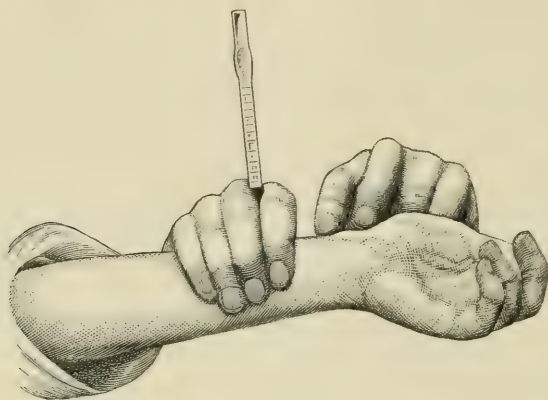


FIG. 18



FIG. 19

A mercury pocket manometer has also been invented by Max Herz,¹ closely resembling Hill's. The index of mercury is interrupted and prevented dropping out into the rubber tube by a stopper-like hook-shaped intervening tube.

¹ Münch. med. Woch., December 8, 1909.

THE HYDROSTATIC SPHYGMOMANOMETER, AND THE REGULATION OF THE PRESSURE IN THE BIER TREATMENT. Bishop's¹ ingenious instrument presents analogies with H. Sahli's sphygmobolometer for testing the force and recording the excursions of the pulse wave.² Sahli

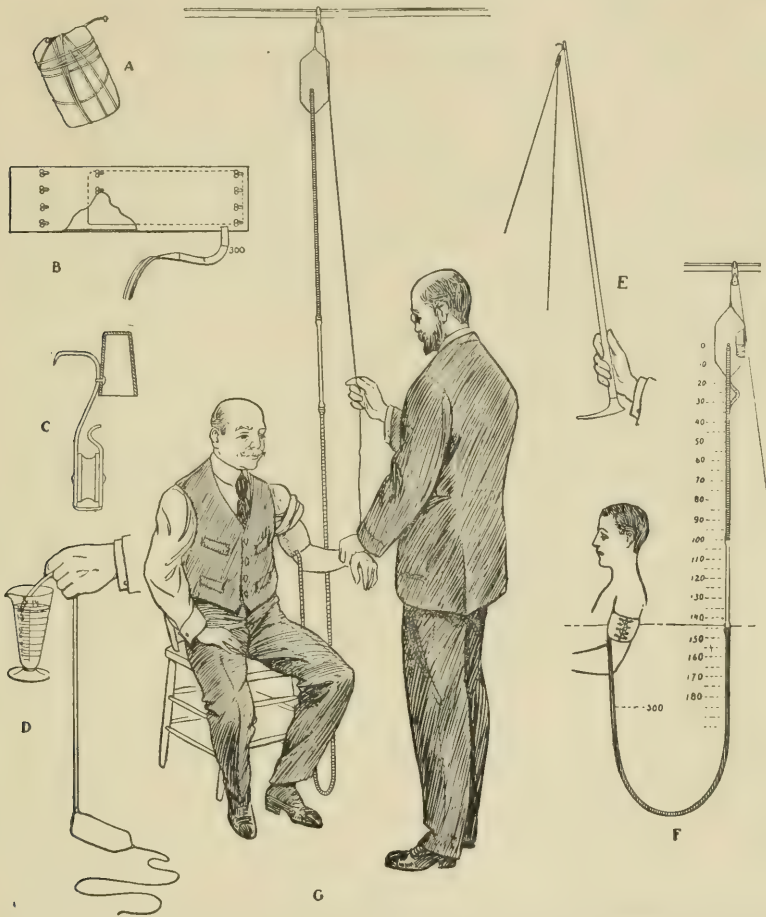


FIG. 20.—The production of hyperemia by means of the Bishop hydrostatic sphygmomanometer: *A*, folded for carrying; *B*, cuff and scale; *C*, hanger; *D*, method of filling (3 xij of water is allowed to siphon after sucking out the air); *E*, hanging the pulley by means of a cane; *F*, diagrams showing the hyperstatic principle; *G*, instrument in use. The cuff is laced on the arm and the point on the scale opposite the level of the heart when the pulse disappears on elevating the reservoir gives the blood pressure in millimeters of mercury.

obtains his results by means of a broad inflatable cuff applied to the upper arm, with a constricting band below, and of a float on the surface

¹ Archives of Diagnosis, April, 1908.

² Described and illustrated in Deutsche med. Wochenschrift, vol. xxxiii.

of the mercury manometer to rise and fall with the pulse. To the float is fastened a cord passing over a pulley above, and ending in a recording apparatus to trace the rise and fall of the pulse wave, which is registered in its entirety; its force being given by the excursion.

Bishop's hydrostatic sphygmomanometer measures the blood pressure by a column of water of varying height. It consists essentially of two rubber bags connected by a tube: one being inside the cuff and the other arranged for elevating and depressing. In the instrument is placed about twelve ounces of water without any air. The accompanying illustration from Grace's¹ paper shows how the pressure inside the cuff may be regulated by the patient. The cuff is laced to the part of the body that is to be compressed and the pressure regulated by elevating the reservoir bag. The original purpose of the instrument is for measuring the blood pressure, which is indicated in millimeters of mercury on the tube, and is read off at the level of the heart at the moment that the pulse disappears (Fig. 20).

For therapeutic purposes it is believed by Grace that this method is easier than that originally suggested in Gordon Wilson's² article on "An Accurate Method of Controlling the Pressure of the Bandage in Bier's Hyperemic Treatment," in which he recommends the Riva-Rocci sphygmomanometer.

¹ New York Medical Journal, July 4, 1908.

² Journal of the American Medical Association, April 4, 1908.

DERMATOLOGY AND SYPHILIS.

BY WILLIAM S. GOTTHEIL, M.D.

DERMATOLOGY.

Adrenalin in Skin Diseases. Attention has recently been again directed to the employment of this agent externally for diagnostic and therapeutic purposes, notably by Sardon.¹ Unfortunately the claims made for it are so great as to justify the generally skeptical attitude of dermatologists toward it. Thus the author in question claims that it is rapidly absorbed when painted on the skin, acts in the depths of the tissues, more especially on the vessels, causing a more or less permanent vasoconstriction, and thus aids in tissue defence in a manner similar to the constrictive hyperemia of Bier. It is said to be effective in such diverse affections as the toxic erthemas, urticaria, acne, sunburn, eczema, pruritus, nevus, inflamed chilblains, rosacea, etc., not to speak of such non-dermatological affections as varices, sciatica without neuritis, arthralgia, and arthritis. It is well, therefore, to recall the careful investigation of the therapeutic value of the drug as an external agent made by Ravogli some time ago.²

Ravogli found that adrenalin had no effect on healthy epidermis, there being no absorption; an excoriation or other break in the skin was required. When this was present the ischemic action was marked, coming on one to two minutes after its application, and lasting from one to three hours. Circulation and, consequently, metabolism and nutrition were diminished. Therapeutically he has found this useful in abbreviating the generally tedious treatment of rosacea and rhinophyma. After deep scarification in the usual manner, one drop of a 1 to 1000 adrenalin solution is injected deep into the tissues, controlling the hemorrhage, diminishing the congestion and redness, and eventually causing permanent decrease in the chronic engorgement and connective-tissue hypertrophy. In nevus vascularis and telangiectasis Ravogli claims gratifying results. The nose and cheeks are first washed with a 2 per cent. carbolic acid solution to cleanse the surface, the part sprayed with ethyl chloride to anesthetize them, and the bloodvessels then cut through. The blood is allowed to flow for a little while, the part is washed again with the antiseptic solution, and then the surface is covered with a piece of lint soaked with the adrenalin solution. The surface becomes anemic and yellowish white in color; and persistence in this

¹ *Annales Générales de Médecine*, Februray, 1909.

² *Lancet-Clinic*, February 17, 1906.

treatment leads to a gradual obliteration of the offending vessels. Besides this, the author employs adrenalin to limit the hemorrhage after curetting sores and granulating ulcers. In urticaria, pruritus, etc., and the other diseases in which the remedy is lauded by Sardon, Ravogli does not report any encouraging results.

This is not a very extended field of usefulness; and in the affections mentioned we possess in CO₂ a very much more useful and effective agent. A further suggestion for the employment of adrenalin as an aid in diagnosis has been made by Winkler.¹ In cases more especially of indeterminate and localized tumor formation in the skin, the application of adrenalin, he claims, will cause a circulatory anemia lasting for some time. This cuts out the signs of vascular engorgement from the picture, and permits the more ready recognition of lupoid, syphomatous, tuberculous, and other new growths.

Chancroid. This subject has not been reviewed for several years,² and for two reasons. In the first place there has been little that is new to record; no improvements of any importance have been made either in the technique of the microscopic determination of the disease by the finding and culture of the Unna-Ducrey bacillus, or in the methods of treatment. In the second place, there seems to be a decided decrease both in the frequency of the affection and the severity of the cases that appear. This is certainly the case in New York; chancroid is becoming infrequent even in the Skin and Venereal Wards of the City Hospital, and the severe and extensive phagedenic cases so common there during my house service in the 80's are but rarely seen; nor do we usually meet with any but the earlier and milder cases in the ambulant clinics. It is possible that the type of the organism is becoming less virulent; and it is possible also the greater certainty in its early recognition and more vigorous and appropriate methods of treatment may be responsible for the present state of affairs.

In PROGRESSIVE MEDICINE for September, 1904, mention was made of the *ethyl chloride* spray freezing method of treatment recommended by Brandweiner, all of whose thirty-three patients showed excellent results from it. I have used it myself in several cases with great satisfaction; pain and reaction was slight, and healing under various indifferent applications was usually prompt. The great susceptibility of the chancroid bacillus to extremes of temperature would lead us to expect good results. I would urgently recommend the use of the solid CO₂ stick in these cases. It can be cut to suit a lesion of any size, and applied without any local anesthetic, since the application itself has this property. For the details of the application I refer the reader to last year's review.³

¹ Archiv für Dermatologie, November, 1908, p. 286.

² PROGRESSIVE MEDICINE, September, 1904, p. 109.

³ Ibid., September, 1908, p. 104.

Temperatures at the other extreme of the scale have long been known to be efficacious in the treatment of chancroid; and I know of no method of treatment that is more promising, especially in the extensive and rapidly ulcerating or phagedenic forms of the disease than the application of dry heat. It is best employed by means of the Paquelin cautery, a suitable point, broad or pointed, being heated to a dull cherry red and held for a few seconds within a millimeter or two of all the affected surface. Care must be taken that the heat reaches all the crevices and sinuosities of the lesion. Of course, the application is very painful, and local anesthesia with cocaine or eucaine does but little to mitigate it; in cases that are at all extensive or deep, general anesthesia must be used. In a very severe case that I saw in consultation with Dr. Wollbarst, of this city, during the past winter, the ulceration had been progressing for many weeks, in spite of the most varied therapeutic measures that had been employed. Half of the glans was gone, the lateral surface of the urethra was exposed and the canal perforated, and the destructive process was extending down onto the sheath. The entire inefficacy of the various curative measures and the steady progression of the destructive process, the constant and severe pain and the loss of sleep and general malnutrition that ensued, had brought the patient into a pitiable condition. He was anesthetized with chloroform, and the cautery thoroughly and extensively applied. The tissues were not actually touched with the hot metal; but it was held for about ten seconds as close as possible to every surface, sinuosity, and sinus of the ulcerated area. There was considerable after pain, necessitating the use of an opiate; but there was also an immediate and marked improvement in the condition of the lesion to such an extent that the patient himself was anxious for a repetition of the treatment later. It was deemed necessary to do this several times during the weeks following, but to a very much less extent, and without anesthesia. The patient made a perfect recovery, and with astonishingly moderate deformity of the penis.

Kreibich¹ opposes the excision of these lesions, even in their early stages; he says, and I agree with him, that chancroidal infection of the wound always occurs, and the ultimate result is an extension of the disease. He is also opposed to the use of the cautery, claiming that it favors the appearance of bubo; this has not been my experience, when the cautery is employed in the manner advocated above. He cauterizes the lesions thoroughly and repeatedly with sulphate of copper, and then applies litharge ointment. If phimosis is present, and an intrapreputial chancroid is known or suspected to exist, the prepuce must be split, though a chancroidal wound will necessarily result. I no longer advocate circumcision in these cases; the cosmetic results are bad, and

¹ *Archiv für Dermatologie*, November, 1908, p. 245.

the less extensive an infected lesion we can get the easier will be the subsequent treatment. Paraphimosis must be reduced, with the help of an incision of the constricting band, if necessary. Kreibich's treatment of the suppurating bubo, a small incision, iodoform drainage, and the Bier suction treatment, is to be approved of.

Müller¹ advocates the use of hot air in chancroid, claiming that it stops the virulent process, promotes healing, and cuts short the lymphangitis. This is essentially the same as the cautery treatment recommended. He uses the galvanocaustic knife if the prepuce has to be split. I see no special advantage in this, since the wound is bound to become subsequently infected. Alcohol compresses are advised for the lymphangitis.

Heat in another form is advised by Zinsser.² He uses 1 to 4000 permanganate of potash irrigations, as hot as can possibly be borne (45° to 50° C). He uses 4 to 5 liters (4 to 5 quarts) at a time, at a height of 2 to 3 meters (6 to 9 feet), and with a stream about 2 millimeters thick. Most astonishing results have been attained, especially in gangrenous and lymphangitic cases. After the irrigation he applies tampons soaked in equal parts of spirits of camphor and water; and if there is a tendency to necrosis he uses frequently changed hot linseed meal poultices.

These various measures are essentially modifications of the application of extremes of temperature; and they have displaced the use of medicinal remedies in chancroid to a large extent. The use of the hot air jet requires special apparatus, and is, therefore, less convenient; but the carbon dioxide or the ethyl chloride spray for the cold, or the Paquelin cautery or hot permanganate irrigations for the hot applications can be readily used by any one.

Comparative Dermatology. It has always been a matter of surprise to me that so little attention has been paid by dermatologists the world over to the skin affections of animals, especially those of the domesticated varieties with which many people are brought into intimate association. It can hardly be doubted that much light would be thrown on many dermal problems in human beings, and that the whole field of dermatopathology would be benefited. There are, of course, many obvious obstacles in the way, chief of which, perhaps, may be mentioned the difficulty of obtaining material in quantity sufficient for effective study. Years ago, when I was teacher in general pathology in the largest veterinary school here, I made an attempt to collect material for the purpose; but with practically no clinics at which numbers of cases could be seen, it was impossible to study any branch of the subject effectively. Latterly, however, renewed attention has been directed to the dermatohistology and pathology of the lower animals by some

¹ Deutsche medicinische Wochenschrift, 1908, No. 4.

² Münchener medicinische Wochenschrift, year 55, No. 18.

of the European investigators, more especially in connection with the study of the dermal manifestations of syphilis and other infections in animals, and with experimental work on tumors of various kinds.

Terebinsky¹ has made an exhaustive study of the histological structure of the skin in various breeds of monkeys; a matter of importance, in view of the present extensive employment of these animals for the experimental research of syphilis, and the far-reaching pathological and therapeutical conclusions drawn therefrom. The details of his investigations are too technical for reproduction here. It will suffice to point out that he found important histological differences, especially in the lower varieties of these animals, which must be borne in mind in interpreting pathological appearances.

Audry and Suffran² have studied various tumors of the domesticated animals; and whilst their work is of necessity extremely fragmentary, it is of interest inasmuch as some of the affections are very common. They investigated:

1. *Warts*. These are among the commonest of newgrowths of the animal skin, especially among cattle. They are often very large, sometimes increasing to such a size as to kill the animal. They occur anywhere on the hairless skin and upon the mucosa. They are caused by a definite organism, the *Bacterium porri*, and they are certainly contagious; two statements of great interest to us. Many of us, myself included, hold that clinical experience show warts to be contagious in the human subject. Evidence as to their bacterial origin in man, though suspected, is still wanting. It is quite possible that the study and culture, and inoculation of the animal agent may throw light upon the subject in man.

2. *Epithelioma Contagiosum of Birds*. Here the lesion is entirely similar to that in the human subject; but no parasite was found, and as yet no definite conclusions as to the etiology have been reached.

3. *Connective-tissue Tumors*. These, as is well known, are extremely common in animals, more especially in cattle, horses, and mules. Morphologically and pathologically they are exactly similar to like growths in the human subject. One fibroma found in a cow weighed 174 kilograms (382 pounds).

4. *Epithelial Newgrowths*. These are fairly common in animals, and correspond to the human types. True adenomata, rare in man, are common in dogs, as are also some of the rarer mixed types. This type of growth seems suitable for especial study in canines.

5. *Folliculitis*. This dermatosis in animals is usually caused by one of their varieties of the *Demodex folliculorum*, a parasite that is extremely common, but not pathogenetic as a usual thing in man. The clinical

¹ Annales de Dermatologie et de Syphiligraphie, December, 1908, p. 692.

² Archivs de Dermatologie et de Syphiligraphie, 1908, Nos. 10 and 11.

picture is that of an *acne pustulosa*, a scabies, or a superficial erythema; microscopically it is that of an *acne pustule*. Undoubtedly, this is one of the many dermal affections grouped by the veterinarians under the indefinite name of mange.

6. *Botryomycosis*. This affection has no clinical resemblance in animals to the human affection, where it looks very like a cutaneous tuberculosis. It is, probably, bacterial, and due to the *Botryococcus askoformans*. It is rarer in man than in animals.

7. *Filiariasis*. This is the cause of a persistent ulceration that occurs on the backs of horses, especially in summer. It is occasioned by a filaria; and the lesions are very like those of human actinomycosis, chronic tumors, breaking down and leading to sinus formation, and long-continued suppuration and ulceration.

Quite recently Leslie Roberts has published the results of his studies on the *diseases of the skin in animals communicable to man*.¹ Considering first the vegetable parasites found in both classes, he divides them into groups as follows:

Group 1. Includes a number of cocci which are on the boundary line between saprophytical and parasitical life. The parasites of seborrhea, comedo, pityriasis, folliculitis in all forms, and all the deeper skin infections to furuncle and carbuncle. Though similar in appearance, and parasitic, they are not, so far as we know, usually communicable to man.

Group 2. This includes the various affections due to streptococci from a slight impetigo to lymphangitis and erysipelas. The dermatitis contagiosa pustulosa canadensis, the horsepox of the English veterinarians, is, according to Schindelka, the ordinary impetigo contagiosa of man, with additional deep pus infections. Dieckerhoff and Grawitz have isolated an organism in the disease very similar to the *acne bacillus* of Unna and Grawitz; but their identification does not seem satisfactory, and it is better for the present to classify the affection as above. It seems probable, also, that the pemphigoid eruptions in animals belong to this impetigo group.

Group 3. This contains the three important parasitic organisms of tuberculosis, glanders, and anthrax, all of which develop much of their activity on the cutaneous surface. The tubercle bacillus behaves very much as it does in man on the animal skin, occasioning indolent, limited tumefactions that may or may not finally ulcerate. These may occasion local tuberculosis in man; as also may the milk of tuberculous cows or the sputum of other tuberculous animals. The bacillus of glanders, which is to the horse what tuberculosis is to cows, is usually inoculated through the nasal mucosa; but infection may occur through the general integument, in which tissue most of the early lesions occur. The anthrax bacillus and its effects are too well known to need recapitulation here.

¹ British Journal of Dermatology, March, 1909, p. 72.

Group 4. The group of the streptothrices includes actinomycosis and Madura foot. The liability to actinomycotic infection must be slight, as the number of the human cases shows. Madura foot is so extremely rare that it need not be considered here.

Group 5. This includes the hyphomyces or fungi, of especial interest to the dermatologist. They live on the keratinized products of the human and animal skins, which they break up and digest by means of keratolytic ferments; and they present an extraordinary amount of variation in their forms of vegetation and fructification according to the host or substance in which they are found. Hence, all the elaborate efforts to classify the microsporons and trichophyton morphologically have so far been practically failures. For our purposes the old classification of ringworm and favus are quite sufficient.

Ringworm is most frequent in calves, and next commonest in dogs. Horses, goats, and cats are less frequently attacked, and pigs and sheep still less frequently. Small rodents, rabbits, guinea-pigs, and mice can be inoculated with the trichophyton, but probably do not suffer otherwise from the infection. The achorion, however, the favus parasite, does occur spontaneously in rabbits, guinea-pigs, and mice. Human infection from the domestic animals is so frequent that a brief consideration of these affections will be of interest.

In *cattle*, ringworm is usually confined to the head and neck, but occasionally covers the whole body. It appears as sharply defined, grouped, scaly or scabbed patches, which may be bald or studded with broken-off hairs. When crusted the surface of the patches has a gray, asbestos-like aspect. Removal of the scabs shows the mouth of the follicles filled with pus. In the adult animal the disease tends to a spontaneous cure, but in the young it is very rebellious, and in calves, lambs, and sucking goats and pigs the affection is usually most pronounced about the mouth. In the worst cases the entire hide may be more or less bald, covered with bran-like scales, and with the hairs fallen out or broken off.

In the *dog*, ringworm is most frequent on the head and limbs, but it may affect the entire body. It begins as sharply defined more or less bald patches, looking a good deal like alopecia areata. The patches have the peculiar gray, asbestos-like scales, and show many broken-off hairs. There may be more or less inflammation and scabbing from scratching.

In the *horse*, the affection is fairly frequent, and is known as herpes contagiosa; it may be epidemic. Circular patches, on which the hair is either broken off or fallen out, occur on the back, shoulders, flanks, and sometimes upon the head. Desquamation is marked; but deep pus infection, so common in ringworm in man from this source, is usually absent.

In the *sheep*, scaly or scabbed patches form on the neck, shoulders,

and back; the wool may become entangled and fall out; and there is much itching.

In *poultry*, ringworm is not uncommon, and is transmissible to man.

In a general way we may say that the symptoms of ringworm in animals are simpler and more uniform than in man, consisting of localized circular areas of baldness, with broken hairs and some cuticular desquamation. In the human subject they vary from these comparatively slight manifestations to deep-seated pus infections resembling actinomycosis (kerion).

In *favus*, the symptoms on the skins of animals are very similar to those in man. The chief mass of the fungus is heaped up on the surface of the skin around the hair follicle opening, forming the familiar sulphur-yellow cups. It finally forms grayish-yellow or sulphur-yellow scabs and causes atrophy of the hair. When the scab falls off more or less circular depressed atrophic areas are left. In sucking animals the disease is most frequent about the head. In cats, it is generally on the paws, claws, and ears; a fact that point to its acquisition from the mouse; in rats and mice it is common, especially affecting the head. Dogs, rabbits, hares, and guinea-pigs suffer from it; horses are but seldom affected. In fowls, it is known as "white comb;" the comb, first affected, is covered with a grayish scab, a concretion that slowly exudes and thickens; and the affection may remain localized there for months. It finally, however, spreads over the body; the feathers fall out; the animal emaciates, and may die of exhaustion. Favus is occasionally communicated from animals to man, but in the vast majority of cases the infection is from a human source.

Group 6. This includes the animal parasites communicable to the human skin. There are a great many of these; but even if such parasites as fleas, ticks, and lice are occasionally transferred, they do not produce diseases in the strict sense of the word. Our inquiry can be limited to the sarcoptes or itch insects.

Veterinarians distinguish three species of acari parasitic on the skin of domestic animals: (1) The sarcoptes, the female of which burrows in the skin in the same way as does the sarcoptes hominis or acarus scabiei; (2) the dermatokoptes, a non-burrowing acarus; and (3) the dermatophagus, also non-burrowing. All three are transmissible to man, but the two latter quickly die on human skin, and cause only slight symptoms or irritation. They seem mostly transmissible from one species of animal to another; and it is of especial interest that the human acarus may be transmitted to the horse.

Scabies is much more serious in the domestic animals than in man; and it may even end fatally, as in sheep. The thickness of the hair is the chief factor preventing effective treatment. Horses, sheep, dogs, cattle, goats, cats, and hens are often affected; and it has been observed in the lion, leopard, llama, camel, serpent, and parrot. Human cases

have been recorded of infection with the acarus of the horse, sheep, pig, dog, and hen.

Scabies in the horse usually begins on the head and neck, but it may start anywhere. The itching is very severe, more especially at night, causing the horse to rub and gnaw the affected skin. Circumscribed bald patches appear early, with the formation of papules and vesicles, and the scratched part soon becomes scabby. The skin finally becomes indurated and fissured; and if the animal is neglected the disease may spread over the whole body, and finally cause death by exhaustion. Scabies in the other animals gives the usual symptoms of an extended eczematous inflammation, modified by the closely set hair. Papules, vesicles, and pustules; inflamed and excoriated areas; crusted and matted hair, possibly with pus infections under them; these are the appearances in an advanced case of animal scabies.

It seems very desirable that a more extended study of these vegetable and animal parasitic dermatoses be made; our knowledge of them is still very incomplete. The practitioner in the country has better opportunities in this field than the town physician. I would suggest that a careful study, clinical, microscopic, and cultural, of any cases that present themselves, and a publication of the results, would well repay the investigator.

Exfoliating Dermatitis. The diagnosis of this affection is an easy matter. The uniform and persistent redness and thickening of the entire skin, and the peculiar scaling in large thin lamellæ, form a disease picture that is not liable to be confounded with any other condition. Prognosis and treatment, however, are not by any means in as satisfactory a condition. This is due to the fact that under this name are included at least three radically different conditions: one mild in course, unaccompanied by constitutional disturbance, of good prognosis, and fairly amenable to treatment; another, which is really the terminal result of other dermatoses, especially psoriasis, and in general resembling the first; and a third almost always ending fatally and entirely recalcitrant to our therapeutic measures. These conditions have been given independent names; but inasmuch as the symptomatology in the early stages is the same, and even the expert can only distinguish them by results, it is questionable whether the nomenclature differentiation is of value.

Long ago Hebra described a condition characterized by a chronic dry inflammation of the entire integument, with the formation of very large papery scales, and always ending fatally from general exhaustion or internal complications. He called the affection pityriasis rubra; but it was soon noted that there was an affection clinically indistinguishable from it which ran a benign course, and was without atrophy and the internal complications; and other cases were met with that were undoubted instances of chronic eczema or psoriasis, that later took on

the form and course of the benign exfoliative dermatitis. Our present point of view is that well stated by Schamberg.¹ Dermatitis exfoliativa is the same as pityriasis rubra; but there are three distinct varieties of the disease:

1. *The Pityriasis Rubra of Hebra*, a very chronic, slowly progressive, and generally fatal affection. There is generalized dull redness of the entire integument, profuse and continuous exfoliation in thin papery scales, atrophic thinning and contraction of the skin causing ectropion, "clawing" of fingers, etc., and seriously compromising the general health. There is great sensitiveness to cold, chills, progressive weakness, and emaciation, visceral complications, and finally death.

2. *Idiopathic Dermatitis Exfoliativa*. Here there suddenly sets in, accompanied by general malaise and fever, an intense erythematous eruption, which may be in spots at first, but soon spreads over the body and becomes continuous. In a few days there is a profuse scaly flaking, with casts, perhaps, of the palms and soles. The hairs and nails may fall off; and there is a good deal of itching and burning. The disease runs its course in a few weeks or months; it often recurs, even periodically; and it may become chronic, and last for years.

3. *Secondary Dermatitis Exfoliativa*, developing in psoriasis, eczema, lichen planus, etc., and with the general course of the idiopathic form.

In the face then of a general exanthem presenting the characteristic features of the exfoliative dermatitis, a dry, general, large lamellar desquamating dermatitis, a prognosis must be made with reserve. The case may turn out to be benign; or in the course of time atrophy may occur and it may end fatally.

The usual treatment of this affection is by rest in bed, nourishing bland food, and the usual remedies for the acute or subacute forms of eczema. Resorcin, olive oil, lime water lotions or mildly astringent, oily, or fatty applications will do; and hot baths, contrary to their effect in true eczemas, frequently give the patient much relief. Mook² has recently recommended the use of quinine in large doses, 30 or more grains, divided, daily, and reports good results in six cases. In a case on my service in Lebanon Hospital last year the diagnosis was that of the malignant type of the disease, the true pityriasis rubra of Hebra (Figs. 21 and 22). Atrophy was already beginning; there was drawing down of the lower lids, stiffness of the lips and fingers, etc.; and the involvement of the general health was already so great when admitted that it was impossible to present him, as intended, at a medical society. In addition to the general measures, he was put on quinine in large doses, finally going up to 60 grains a day in divided doses. At first this did not seem to do him any harm, though the resultant tinnitus and

¹ Diseases of the Skin, 1908, p. 141.

² Journal of Cutaneous Diseases, September, 1908, p. 408.



FIG. 21.—Dermatitis exfoliativa. (From the collection of Drs. Lyman and Mook.)

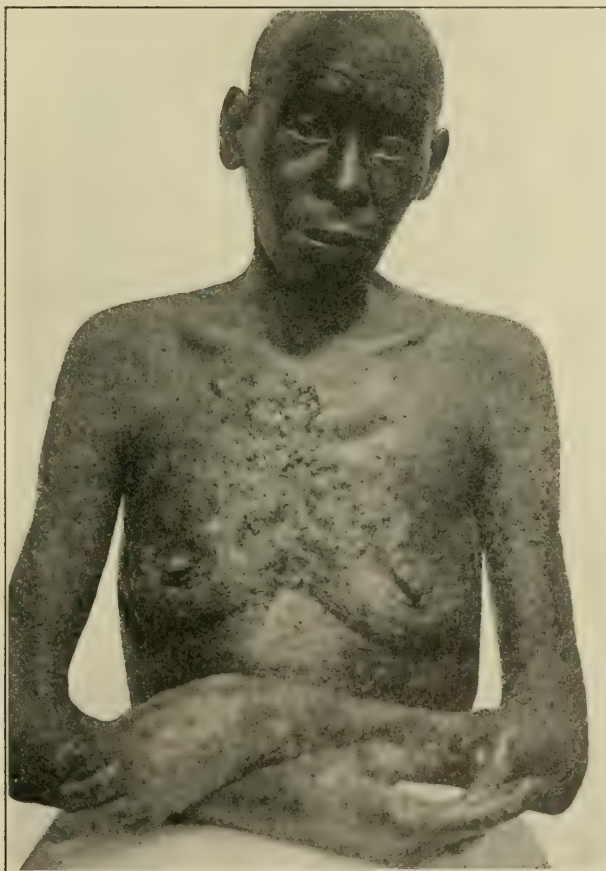


FIG. 22.—Pityriasis rubra. (From the collection of Drs. Lyman and Mook.)

deafness was very annoying; the redness faded away almost entirely from his skin, and the lamellar scaling ceased. But his gastro-intestinal tract finally became so deranged that the treatment had to be stopped; whereupon the skin condition soon resumed its former aspect. Six weeks later he contracted pneumonia and died.

Erythema Figuratum. Under the name of erythema figurata perstans, G. W. Wende¹ describes a generalized skin affection that had been present since soon after birth, and which presented some unusual features.

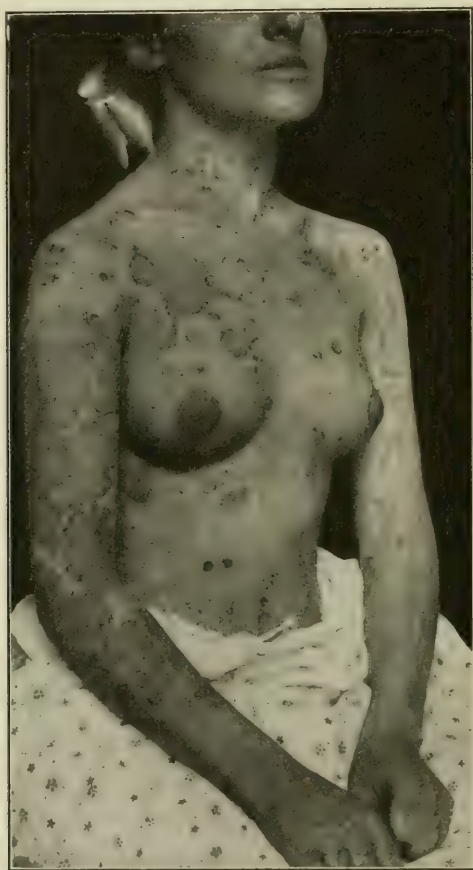


FIG. 23.—Erythema figurata. Erythema present since birth. Treatment almost without influence. (Case of Dr. G. W. Wende.)

The patient was a girl, aged sixteen years, and whilst the eruption was not permanent in the sense of not changing, it constantly disappeared and returned, and for the last two years her body had never been quite free from it. When examined in the summer of 1906, the abdomen, the

¹ Journal of the American Medical Association, December 5, 1908.

arms to the wrists, and the legs to the ankles showed rounded, oval, or elongated ringed efflorescences. Their centres were pigmented and covered with fine scales; while at the margins was an advancing line, elevated, reddish, and more or less scaly. The lesions grew rapidly, and coalesced; finally they faded out, new ones meantime making their appearance. Subjective sensations were slight; the eruption was not inflamed or eczematous when seen, but the patient stated that it had been irritated and discharging serum at times in the past (Fig. 23).

A number of similar cases have been recorded in the past, and have usually been considered to be varieties of the erythema multiforme group. The author, however, calls attention to several marked differences between the two affections, which seem to entitle the malady under consideration to a separate place. In erythema multiforme there is usually constitutional disturbance, which was entirely absent here; and the affection runs a definite course, longer or shorter. Then the lesions of erythema multiforme are usually varied; either at the same time or in different recrudescences they are papular, tubercular, vesicular, bullous, or gyrate. Here they were permanently of one type. These considerations are sufficient, I think, to enable us to coincide with the author's opinion that the affection under consideration is a distinct one. The treatment that was tried during eighteen months, including arsenic, thyroid extract, and the x-rays, was unsuccessful.

Human Glanders. Since some of the most prominent symptoms of infection with the bacillus mallei appear on the skin, and the differential diagnosis, after the eruption appears, must be made from a general pustular syphiloderm and smallpox, a brief consideration of some recent cases may not be out of place here. But few instances have been reported in the literature, giving rise to the idea that it is rare in man, and that human susceptibility to it is but small. Yet I find at least six cases reported in the dermatological literature of the last year.

The best recent American report of a case is by Zeit¹. The patient was a teamster, aged forty-five years, and his sickness began with a thin watery discharge from the nose, which later became slightly blood-tinged and purulent. There was a chill, followed by headache, fever, delirium, and general symptoms of a typhoid type. An eruption appeared first on the left shoulder, and then on other parts of the body. At first vesicular, it later became pustular, and finally bullous. The temperature rose to over 104°; evacuations became involuntary; and the patient died on the twenty-eighth day after the initial chill, with a temperature of 107°. Autopsy was denied.

Zeit has described the eruption carefully, and the picture, together with the general symptoms, shows a very considerable resemblance to variola. It began with the appearance of a few vesicles, filled with

¹ Journal of the American Medical Association, January 16, 1909.

clear serum, on the left shoulder. These rapidly increased in number, and became pustular; and then similar lesions appeared on the scalp and right wrist. Gradually the entire body was covered; and an ulceration appeared on the glans penis, which subsequently became gangrenous. The eruption at its height consisted of discrete bulla, some more than pea-sized, and resembling smallpox lesions. Some were even distinctly umbilicated. Most of the pustules were distended, pointed, and glistening, of a grayish yellow color, and surrounded by a narrow hyperemic zone. They contained a viscous fluid with many polymorphonuclear leukocytes and glanders bacilli. Small red macules and papules were distributed in moderate number between the distended pustules (Fig. 24).



FIG. 24.—Human glanders. (Dr. Zeit's case.)

The bacteriological examination was of interest, for although the initial nasal discharge and the irregular course of the eruption militated against the variola diagnosis, and the intense and acute general infection disposed of the idea of a general pustular syphiloderm, the diagnosis finally rested upon it. The bacilli were non-motile, grouped in small chains of two or three, and staining irregularly on account of the chromatic globules within them. These latter caused an appearance, in thick smears, as if they were staphylococci. This, in the author's opinion, explains the frequency of supposed staphylococcus aureus contaminations in glanders that are reported in the literature. Agar cultures also gave glossy, elevated, yellowish colonies very similar to those of the staphylococcus. The morphological and tinctorial characteristics of the *Bacillus mallei* in thin smears, and the absence of all other bacteria, render the diagnosis from a smear of glanders pus so easy (Fig. 25).

The case reported by Cagliari¹ had the same initial ichorous nasal discharge; but the first cutaneous or rather subcutaneous lesions appeared as a number of foci of apparent cellulitis, and were incised. A diagnosis of pyemia was made, but no pus organisms were found in the smears. Later the characteristic glanders bacilli were found. The man died on the tenth day; and on the day before his death he developed a general exanthem that looked very much like smallpox.

Meyer and Crohn² have reported a case beginning with chill, high fever, and delirium; in a few days there were painful swellings of the extremities and joints, enlargement of the inguinal glands, and a general eruption composed of numerous acne-like pustules on reddened bases.

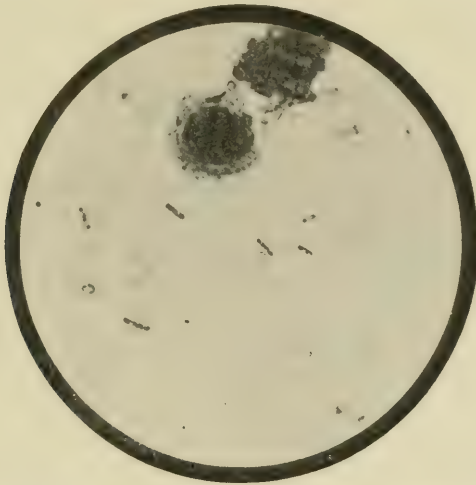


FIG. 25.—Human glanders. Coverglass smear from opened pustule, showing lymphocytes and glanders bacilli. $\times 1000$. (Dr. Zeit's case.)

Here again there were hemorrhagic vesicles on the corona glandis, followed by ulceration. Blood cultures then showed the presence of the *Bacillus mallei*; death followed a few days later. In this case there was not the characteristic nasal discharge from the site of inoculation; and the authors call attention to the difficulties of the diagnosis in view of the non-characteristic nature of the general symptoms when the skin eruption is delayed. According to them, also, every case of glanders infection thus far reported has turned out fatal, with the exception of one case of laboratory infection.

That this is too pessimistic a view of the disease is shown by the cases reported by Bevan and Hamburger.³ A farmer infected himself on the hand from a sick horse, and died in a few weeks. All the other horses

¹ San Francisco Academy of Medicine, November 24, 1908; Journal of the American Medical Association, May 16, 1908.

² Dermatologisches Centralblatt, December, 1908, p. 82.

³ Ibid., p. 82.

became infected; and finally a brother of the dead man and his fourteen-year-old son acquired the disease. Both finally recovered. The diagnosis was rendered certain by bacteriological examinations and animal inoculations.

It is probably true, as most of the authors surmise, that the infection is commoner than is generally supposed, the cases being diagnosed as ordinary pyemic infections, or confounded with smallpox and syphilis.

The Carbon Dioxide Treatment of Lupus Erythematosus. In last year's review I detailed the method of handling carbon dioxide for therapeutic purposes,¹ and brief mention was made of its employment in this most obstinate of dermatoses. My experience of it at the time was still in the experimental stage, and I was not prepared to make a definite statement as to the results obtainable. Since then, however, I have had occasion to employ it in several cases; and in two of them at least I have been able to follow out the treatment for a length of time quite sufficient to enable me to formulate positive conclusions. As the result I can say that not only do I consider the CO₂ treatment the very best that is at our disposal for many cases of the disease, but also that its employment constitutes a very important advance in the therapeutics of this affection, and enables us to deal with it in a very satisfactory and radical manner.

The first of these cases was that of a young lady, aged twenty-five years, who had had the disease since 1904. She had had the very best of treatment, having been under the care of Brooke, of Manchester, England, for over a year; in spite of this, however, there had been a steady advance in the disease. When Dr. Schnaper, of New York, first sent her to me, on August 18, 1906, the lupoid patch measured over 2 x 1 inches, covering both sides of the nose, and extending up on the lower lid and canthus on the left side. The entire area was elevated, yellowish pink, and with some adherent greasy scales. There was marked itching, but as yet very little atrophy. After some ineffectual attempts to influence the persistence and gradual spread of the disease with green soap, resorcin, iodoform, emplastrum hydrargyri, tar, and other agents, it became evident that nothing less than complete destruction of the diseased area would do; this is the inevitable result of the disease when left to itself or when ineffectually treated. In January, 1907, I began the use of trichloroacetic acid, at that time the best local destructive agent that I knew of; and it was persisted in for the entire year. The pure deliquescent crystals were carefully applied by means of a small damp swab, at intervals of from two to four weeks, in accordance with the reaction. Though the applications were very painful, the patient bore them with fortitude. The immediate results were apparently very good; when the superficial white eschars turned white and fell

¹ PROGRESSIVE MEDICINE, September, 1908, p. 104.

off the disease appeared to be eradicated. But inevitably new foci in the form of raised, pinkish, itchy, scaly, and spreading patches would reappear in the treated areas, and there was a slow but unmistakable peripheral extension.

At the beginning of 1908 the solid CO₂ treatment was begun, and during the year the remedy was used some fourteen times. At each session two to five foci, small and large, were treated, the time of application varying from twenty-five to fifty seconds, and both that and the amount of pressure exerted varying with the location treated. It was necessary to go right up to the edge of the internal canthus on one side, and down to the *alæ nasi* below. The former application caused no trouble in the eye save a slight conjunctivitis, the lid, of course, being carefully drawn down as far as possible by an assistant, and the eyeball protected with dry cotton. The reaction was frequently very marked, large bullæ forming; they were allowed to dry up without any dressing, and the scab usually fell off in less than two weeks, leaving a smooth layer of scar tissue behind. Special care was given to the advancing edges, the applications being made at least a quarter of an inch beyond them. Perhaps a little too much attention was paid to the subjective sensations of the patient; and spots and edges were frozen where itching was complained of and where the patient felt sure that some of the disease remained, though it was hardly possible to see any definite lesion. By November, 1908, however, no sign of diseased tissue could be seen; and though the patient still complained of some itching points, treatment, save for a bland sulphur-zinc ointment, was discontinued.

On April 2, 1909, six months later, the patient was shown at the Manhattan Dermatological Society as a cured case. The itching had gotten gradually less, and had at last entirely disappeared; and there was not a trace of diseased tissue anywhere in the affected area. The bridge and sides of the nose and a very little of the cheek on both sides were occupied by a soft, smooth, whitish scar, very little depressed, and extremely inconspicuous. Even the lower lid at the internal canthus was merely white; there was absolutely no drawing or deformity. Up to the time of the present writing, May, 1908, the cure has been permanent.

The second case was just as brilliant in its results; to avoid repetition I shall merely outline it, as it was precisely similar to the first one, but much more extensive. The disease had been present for a number of years, and covered the nose, both cheeks, the upper lip, and the ears. Areas as large as a silver dollar were treated at each session; and the result was the same smooth and healthy scars that we obtained in the first case. This patient had been treated by many men in various ways for years, and had practically given up hope of ever being cured. So enthusiastic did she become with regard to the CO₂ treatment that it became hard for us to prevail upon her to let us limit the area and the

frequency of the individual applications. If she had had her own way they would have been made over the entire surface every week. Her cure is now almost ended, and I am sure that it will be as complete and definitive as in the first case.

It is absolutely necessary, however, when beginning this method of treatment, to bear in mind and to impress upon the patient the fact that cure without the production of scar tissue and some deformity is



FIG. 26.—Lupus erythematosus of many years' duration. Almost the entire skin of the face transformed into scar tissue. (Dr. Gottheil's case.)

practically impossible. I do not believe that it ever occurs without it in a true case of lupus erythematosus. Left to itself, or ineffectually treated, the malady progresses centrifugally and, by the appearance of new lesions in healthy skin, indefinitely; it stops only when the entire skin area has been transformed into cicatricial tissue. It may last for life; and in old cases it causes most distressing and disfiguring deformity (Fig. 26). The only treatment in which I have any faith at all is one that effects partial or complete destruction of the entire affected skin. And for that purpose we have no agent that is so effective, so manageable, and so painless as the solid CO_2 .

Menstruation and Dermatoses. In a detailed historical article, Opel¹ has collected all the accessible reports of various dermatoses occurring in connection with menstruation. These are not very numerous; which would tend to militate against the view that the menstrual process per se bears any relationship to the development of skin lesions. He considers folliculitis, erythema, erysipelas, erythema nodosum, ecchymoses, pigmentations, herpes, urticaria, eczema, and circumscribed edema of the skin. He adds to the list three personal observations—an urticaria, an erythema nodosum, and a herpes occurring and recurring with the physiological process. Opel theorizes as to its pathological effects, seeing in it an analogue to pathological genital disturbances in women which, like nutritive and nervous affections, may occasion dermal reactions. He recalls Neusser's hypothesis as to the intimate relationship between the skin and the bone marrow, on the one hand, and ovulation on the other, the first two playing the role of a hematopoietic organ; and mentions the fact that Hebra long ago demonstrated the intimate connection existing between the skin and the genital organs.

King² considers the same subject, reviewing the relation of menstruation to acne, rosacea, eczema, herpes, pemphigus, dermatitis herpetiformis, urticaria, edema and erythema, erysipelas, ecchymoses and purpura, pruritus, psoriasis and seborrhoic dermatitis, hyperidrosis, bromidrosis, chloasma, lupus, and syphilis. He is inclined to attribute all these disturbances, in certain cases at least, to the menstrual function. There is a nervous disturbance with it that probably leads to the failure of normal metabolism and excretion, so that the blood and lymph are overloaded with waste and toxic products. The common phenomena of the menstrual condition, increase in weight, increase in blood pressure, rise in temperature, and the nervous symptoms, are due to the same cause.

In a general way there may be some foundation for these hypotheses; menstruation does bring with it these systemic changes, and their influence on the skin is shown by the distinctly increased activity of all the glandular structures connected with that organ during the flow. Preëxistent skin diseases, especially those affecting the sebaceous and coil glands, frequently become worse just before, during, or immediately after the menstrual epoch. But to regard the physiological process of menstruation as the direct cause of these various dermatoses is quite far-fetched, and needs very much more investigation and proof before it can be accepted. I have never been able to convince myself that a disordered or abnormal menstruation is the causative agent of any dermatosis; nor have I succeeded in influencing it by treatment directed to the genital function.

¹ *Annales de Dermatologie et de Syphiligraphie*, December, 1908, p. 729.

² *Journal of the Tennessee State Medical Association*, February, 1909.

Mycosis Fungoides. Fig. 27 is the picture of a remarkable case recently reported by Burnside Foster.¹ The disease had been present for two years, beginning, as these cases usually do, with inflammatory and eczema-like lesions that disappear and then come on again. After about a year there appeared elevated spots on the face and arms, gradually becoming purplish and discharging a little pus, and itching very severely. In July, 1908, other portions of the skin began to be



FIG. 27.—Mycosis fungoides. (Case of Dr. Burnside Foster.)

affected, and the lesions began to grow into cauliflower-like tumors. Finally, the condition became that shown in the illustration. The face, hands, arms, and feet were more or less covered with soft, protuberant vegetating growths, exuding considerable pus, and very foul. The body was entirely free and, save for a slight rise in temperature, the functions were undisturbed. Urine and blood were negative; microscopic and

¹ Journal of Cutaneous Diseases, February, 1909.

cultural examination of the pus and secretions from the skin showed nothing but the pus organisms. Sections of the skin showed an abundant round-cell infiltration with a connective-tissue stroma and some necrotic areas. The general picture was that of granulomatous tissue.

The chief interest in the case lies in the results of treatment. She was given x-ray exposures every second day, using a soft tube about six inches from the lesions; ten-minutes' exposure from a 12-inch coil. After the fourth exposure, eight days from the beginning of the treatment, improvement was manifested. The abundant secretion ceased, the lesions became dry and friable, and the tumors diminished very much in size. The improvement has been steady since then. The patient was also given arsenic, 30 drops of Fowler's solution daily; but the author attributes the improvement solely to the rays. The local treatment consisted of a 1 to 1000 permanganate of potash solution applied to the affected skin by spray and compress, and the patient was made to spend as many hours as possible outdoors exposed to the direct rays of the sun.

A further report on this case may be awaited with interest. A number of improved cases of the disease are reported from the treatment, but no permanent cures, so far as I know. As much can be effected by other means in some cases, for unknown reasons. The tumors have disappeared under arsenic for a time; and I have myself had a case, far advanced, in which every one of them went away under large hypodermic doses of Coley's mixed toxins. So marked was the improvement that the patient was not recognized when presented at a medical society after treatment, though he had been shown six months before, anterior to beginning the injections. The disease soon reappeared, however, and the case terminated fatally. This is not to be wondered at when we remember that mycosis fungoides is probably a form of sarcoma, and that not only the skin, but the internal organs also are affected with the newgrowth.

Osteoma Cutis. Unorganized mineral deposits in the skin were noted in my first review in 1901,¹ under the heading of dermal concretions; true bone formation in the skin, however, has not been reported for many years. In fact, as Heidingsfeld,² in a recent account of a case, remarks, there are only two undoubted cases of the affection on record, those of Salzer and Coleman, to which he adds a third. A bean-sized hairy nevus, apparently of the ordinary type, was removed from a patient's chin, and was found on sectioning to be so full of small isolated and aggregated hard granules that only imperfect preparations could be obtained. These concretions could be shelled out (Fig. 28), and were found on section to be composed of true bony lamellæ, with Haversian canals and concentric rows of lamellæ, bone cells, and their processes.

¹ PROGRESSIVE MEDICINE, September, 1901, p. 155.

² Archiv f. Dermatologie, October, 1908, p. 337.

There were altogether some 50 to 75 of these masses in the tumor. The whole sections showed the usual structure of the hairy and pigmented nevus, and the bony concretions lay between the hair papillæ and the

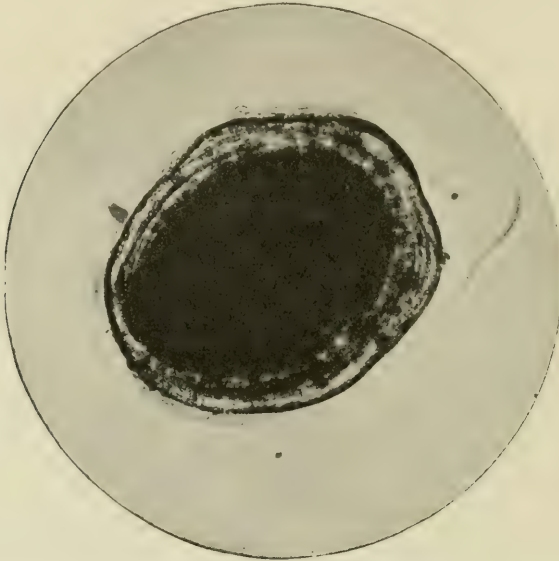


FIG. 28.—Osteoma cutis. Section of a long mass. (Dr. Heidingsfeld's case.)



FIG. 29.—Osteoma cutis. Cavity where a bony mass had fallen out, small-cell inflammatory exudate around it. (Dr. Heidingsfeld's case.)

subcutaneous fat, and usually surrounded by a connective-tissue capsule or some inflammatory exudate. Fig. 29 shows the place where such a bony concretion has fallen out, and the exudate. No cartilage was

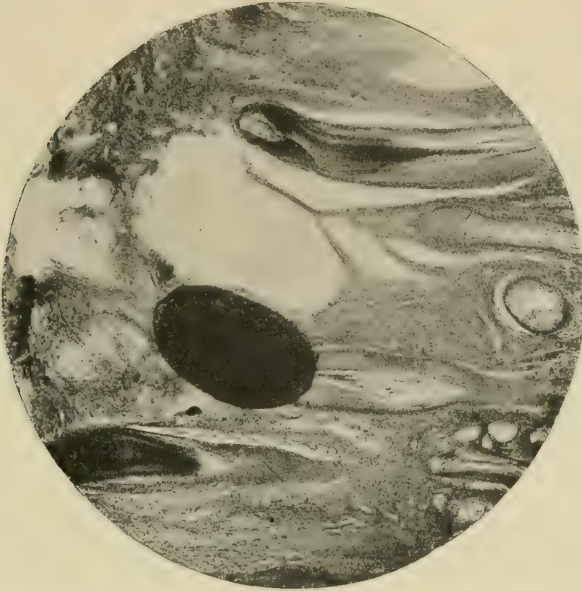


FIG. 30.—Osteoma cutis. Concretion and capsule. (Dr. Heidingsfeld's case.)



FIG. 31.—Osteoma cutis. Section of concretion, showing long structure. (Dr. Heidingsfeld's case.)

found. In Fig. 30 is seen a concretion that has just fallen out of its capsule. Fig. 31 is a magnified view showing the true bony structure of the concretions.

The case is remarkable not only on account of its rarity, but because it differs from the other instances recorded in that the bone was not in one mass, but had developed in a large number of separate foci, and its appearance in a nevus, showing its dependence, like this latter structure, on congenital developmental disturbances.

Pruritus. This subject has not been discussed in these pages since the review of 1905; and it deserves attention both as an idiopathic affection or neurosis and as a symptom of other conditions. With a considerable proportion of our skin patients, itching is the most prominent symptom and the one for which they seek relief.

We can profitably, I think, leave out of this present discussion any consideration of the pruritus that is purely symptomatic and dependent upon other affections. The itching of eczema, prurigo, urticaria, lichen planus, mycosis fungoides, etc., among dermatoses, and that dependent upon such affections as icterus, hemorrhoids, pin-worms, etc., may demand some special measures for its relief; but these are entirely secondary, of course, to the treatment required for the underlying affection. And when such measures are needed they do not differ essentially from many of those that are useful for essential or neurotic pruritus.

The pathogenesis of this affection is still a matter of dispute. Vignolo-Lutati¹ has made an elaborate series of experiments on animals with a view of determining the anatomical condition of the skin during severe essential pruritus, using for that purpose pilocarpine, which he found caused, among other symptoms, erection of the hairs and violent pruritus in the cat. The microscope showed marked tonic contraction of the skin muscles attached to the hairs. The same condition was found in the skin from a man suffering from circumscribed pruritus. The author agrees with Jacquet and others who have investigated this condition, holding that the so-called neurotic pruritus is the symptom of a toxemia of some kind, possibly often intestinal, acting through the nervous system on the terminal nerve filaments in the skin. He holds, however, that the muscular contracture occasioned, and the consequent pressure on the nerve structures in the skin, is the immediate cause of the symptom.

It is interesting to note in this connection that pilocarpine has long enjoyed a just reputation in the treatment of the affection. Jamieson² advocates a two weeks' course of the drug, nightly injections being given. Reid³ regrets the fact that its specific action in many of these cases is not more generally recognized. He begins with $\frac{1}{8}$ grain, since some

¹ Archiv f. Dermatologie, October, 1908.

² Lancet, September 26, 1908.

³ Medical Record, May 25, 1907.

patients are very susceptible to the action of the drug; increases it to $\frac{1}{4}$ if the patient stands it well, and continues the injections once daily as long as may be necessary. He found that the combination of $\frac{1}{120}$ grain of atropine with the pilocarpine prevented the unpleasant sweating in some cases.

Kromayer¹ has made a careful microscopic study of the histological conditions present in pruritus. He finds that there are tiny serous blisters present under the epidermis, even when there is absolutely no macroscopic change apparent in the affected skin. To destroy them he swabs the affected region with cotton dipped in a 15 per cent. solution of caustic potash. In a few seconds pinhead sized, transparent spots appear looking like swollen and burst sago grains when the skin is washed off with water. The epidermis covering them offers less resistance than the normal skin to the caustic, which thus acts electively. When the blisters, which cause the itching are destroyed, the pruritus is cured temporarily or permanently. According to the thickness of the skin affected, the caustic is allowed to act for from five to thirty seconds; it is then washed off, and the treated area receives a wet dressing or a salve; healing is complete in a few days. He has treated 160 patients in this way; he does not hesitate to cover an entire limb, if necessary; and he has never seen any bad effects. He admits, however, that in some cases ulcerations resulted.

I have had no personal experience with this caustic method in pruritus, though I have long used the solution even stronger in obstinate psoriasis plaques, and with uniformly good results. I should not hesitate to employ it over small localized pruriginous areas, however, when ordinary remedies have proved ineffective and deeper reaching, and even destructive applications have to be considered. It is, of course, entirely inapplicable when there is any eczematous or other inflammatory reaction of the skin, or when there is any break in the integument.

Kromayer has also found the *x*-rays useful in certain cases, either alone or in combination with the caustic potash, and especially in pruritus ani. He finds, however, that it is necessary in many cases to push this treatment to the appearance of a Röntgen dermatitis of the first grade, from which he does not shrink. I should shrink from it very much, since it is practically impossible to tell, when such a dermatitis begins, how far it will extend, how long it will last, and how deepseated the destruction will be. I decidedly recommend the caustic potash for the general practitioner; the worst that can occur is some superficial and readily healed excoriation.

A remedy that deserves a far more extensive employment in pruritus than it enjoys is tar, especially in the form of the liquor carbonis detergens. This preparation, said to be a mixture of coal tar, one part, and

¹ Deutsche medicinische Wochenschrift, xxxiv, No. 2.

tincture of Quillaja, six parts,¹ has long been used in England, and is now obtainable here. It may be used pure; but it is generally advisable to employ it as a wet application, diluted:

	Parts.
Liquor carbonis detergens	4
Boric acid	2
Glycerin	2
Water	6

Or as an ointment:

	Parts.
Liquor carbonis detergens	8
White precipitate	1
Lanolin	30

These preparations are efficacious in many of the more chronic forms of eczema, seborrhea, etc.

I am not much of a believer in the internal treatment of essential pruritus; but calcium chloride in doses of 20 to 40 grains three times a day has been highly recommended and can do no harm. It will serve as a safe adjuvant to the local measures.

Jamieson² discusses the pruritus that so frequently remains to give the patient trouble after any one of the various pruriginous dermatoses or other itch-causing affections are cured. This is not a true pruritus, of course; but it is real enough to cause both patient and physician much trouble, and is worthy of consideration here. The author lays out a scheme that is valuable.

1. For the pruritus of the aged: First, medicated soaps, especially menthol soap; nicotiana soap; effective, but to be used with caution, and not too extensively, as it is liable to occasion toxic symptoms; naphthol soap; these to be used as usual in the bath, or the lather applied and allowed to dry on the skin. Starch baths, made by dissolving freshly made starch jelly in the tub of water, followed by the inunction of glycerin and water, equal parts, is quite efficacious in this condition.

2. For the pruritus remaining after eczematous and other inflammatory conditions: The calamine lotion with a dram of boric acid or a little carbolic acid added, thus:

Calamine	1 dram
Powdered zinc oxide	3 drams
Glycerin	1 dram
Lime water	ad 6 ounces

Or almond oil applications containing a moderate amount of menthol, carbolic acid, etc. Most efficacious, perhaps, is a tar paint:

Picis carbonis	1 dram
Benzole	4 drams
Acetone	2 ounces.—M.

Sig.—Filter and paint on.

¹ Journal of the American Medical Association, January 6, 1908.

² Loc. cit.

3. For the severe pruritus that sometimes remains after dermatitis venenata, combustio, lichen planus, etc.: Almond oil and lime water, equal parts, with 25 per cent. of salol or menthol; or the bichloride carbolic ointment:

	Parts.
Mercury bichloride.	1
Carbolic acid	5
Simple ointment	500

Rhinoscleroma. This disease, though rare, is so striking in appearance and uniform in course that it is strange that its recognition as a disease entity is so recent. The first case, recorded by Hebra in 1870, was regarded as a chancre; but this opinion was soon changed in view of its persistency, unchangeableness, the absence of other symptoms, and its non-reaction to specific treatment. Kaposi later considered it a sarcoma; but when Mikulicz, in 1876, discovered in it the peculiar cells that still bear his name, and Frisch, in 1882, found the specific bacillus, very like the ordinary pneumococcus, the independent status of the affection was established.

In an article recently published¹ I have reviewed the affection from the standpoint of our present information and in connection with a report of two cases of my own and the therapeutic results obtained. The total number of cases recorded is now well over 200; practically all of them have come from Southeastern Europe, Russia, and the Danubian region; a very few have come from Egypt and Italy. All the cases seen in other countries have been imported ones; and in some quarters it seems to be almost unknown. Thus in perhaps the largest dermatological clinic in the world, that of the Hospital Saint Louis, of Paris, Cornil and Babes, in 1890, admitted that there had never been a case; and Lenox Brown's three English cases were all in foreigners. Mayer,² in his account of the disease in North America, has collected 16 cases seen here; all of them came from Poland; there were no home cases. Three of these cases have been under my care; two of them were Russians who brought the disease here with them. The third was also a Russian; but the patient had been many years in America, and developed the disease here.

Females are much more frequently affected than males; all my own were in women, and of Mayer's 16, thirteen were females. His youngest case was aged nine years, his oldest, fifty-four; one of my cases, aged seventy, is not included in his list. It is noticeable that every one of the cases has occurred in the poorer classes, living under bad conditions and exposed to privation.

In the first cases recorded the affection was located in the skin of the external nares and the upper lip; and in all the American cases, including

¹ International Clinics, Eighteenth Series, 1908, vol. ii.

² The Laryngoscope, December, 1908, p. 964.

my own, it began there. Invariably, however, other structures, the pharynx, larynx, trachea, and tongue, have finally become affected. Pick has seen a case beginning at the lacrymal duct and involving the lower eyelid, and Potiquet, under the name of otoscleroma, records a case in which the lobe of the ear was first affected. According to Wolkowitsch, in 90 per cent. the nose was affected, in 54 per cent. the upper lip, in 67 per cent. the pharynx, in 22 per cent. the larynx, and the trachea, lower lip, ear, etc., in only a few instances. In the American cases the nose only was involved in 4 cases, the nose and pharynx in 6, and the nose, pharynx, and larynx in 6 also.

The disease picture is so characteristic that there is no possibility of error in any but a case at its very beginning. Quite slowly deep-seated, stony hard, and entirely insensitive nodules and plaques develop in the depths of the tissues, and grow and coalesce into larger tumor masses. They are sharply circumscribed, feel like masses of cartilage or even ivory, and trouble the patient only by the inconveniences of their location. The skin covering, at first normal, finally becomes reddish or brownish, and glistening; dilated and tortuous vessels become apparent as the superficial circulation becomes interfered with; and there may be some surface scaling and desquamation. The tumor masses are not subject to change, save when inflammation occurs from accidental injury or infection. They grow for a number of years, and then the process of involution begins. They begin to shrink, flatten out, and may disappear; and with them occurs atrophy and deformity of the skin, cartilages, and other structures involved with or affected by the growth.

The rhinoscleromatous tumors never undergo malignant degeneration; but their importance arises from the deformity that they occasion when seated in the skin of the nose or lips, and the very serious disabilities and functional disturbances that they lead to when located in the tongue, pharynx, or larynx. The nostrils may be enlarged and stiffened, the tip of the nose projected forward, and the entire facial expression changed. Occlusion of the nasal passages leads to the usual disturbances incidental to forced mouth breathing. The lips and tongue may be so enlarged and hardened that speaking is much interfered with. Invasion of the pharynx makes deglutition painful; and the tendency to contraction of the faucial isthmus, in the face of the necessity of keeping it patent, may lead to very painful erosions and ulcerations. When the larynx, trachea, and bronchi are affected, the voice becomes changed and harsh; and these cases are serious on account of the interference with breathing, since tracheotomy may be required for the gradually increasing or suddenly appearing laryngeal stenosis.

In the later stages of the disease, while the disability may be less, the deformity occasioned by the disease is usually greater. The affected tissues atrophy and disappear; the lip and nose shrink, the velum and

soft palate may disappear, and the entire palatal vault may be deformed by cicatricial bands. When the gums are involved, the teeth finally fall out.

The course of the disease is an extremely slow one; the malady may last a lifetime before the final retrogressive changes occur. I append pictures of two of my own cases. The first one (Fig. 32) is that of a Russian woman, aged twenty-nine years when I first saw her in 1905, who had had the disease for four years. The nose, upper lip, gums, tongue, palate, and pharynx were affected. The deformity was very marked, the entire nose and upper lip greatly protruded, the nasal



FIG. 32.—Rhinoscleroma. Earlier stages. (Case of Dr. Gottheil.)

passages entirely stenosed, speech indistinct from thickening of the tongue, deglutition very painful from the pharyngeal ulcerations, and even the breathing interfered with. Two large purplish tumor masses extended down from the lower margins of the nares and the columella; they involved the entire palate and lower nasal passages, and could be seen projecting from the posterior nares into the pharynx. The palate was infiltrated and deformed, the uvula gone, the velum shrivelled, and the entire pharynx stenosed, cicatricial, and ulcerated. It was a good picture of a fully developed case.

The second case (Fig. 33) shows the end results of the affection. The patient was a Russian, aged seventy years, who had had the affection

for many years; exact data were unobtainable. What was left of the upper lip was the seat of a tumorous infiltration of ivory-like hardness, covered with a bluish and more or less telangiectatic skin, and entirely insensitive. The indurated mass occupied both sides of the lip, and extended onto the cheek; but the centre of the lip was entirely absent, as in cleft palate, from the contraction after ulcerative processes. In the middle of the hiatus was a small ulcerated area, where the chief seat of her trouble had always been. The infiltration extended to the roof of the mouth; but the nose and deeper structures were unaffected, and the patient was in good health and but little affected by her trouble.

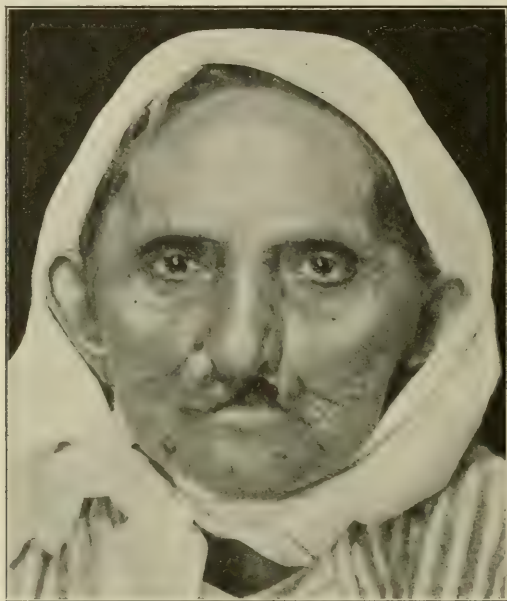


FIG. 33.—Rhinoscleroma, advanced atrophic stage. (Case of Dr. Gottheil)

In discussing the treatment of this affection¹ I pointed out that the good effects claimed by Pawlowsky from rhinosclerin, an extract of the bacillus of the disease, had not been confirmed; and the status of that mode of treatment remains the same today. The *x*-rays, used successfully by Zwillinger, Danziger, myself, and others, seems to do more for the relief of these patients than any other measure. Hartigan and Stuart-Low² do, indeed, suggest the use of the rhinoscleroma toxins and the opsonic treatment, but do not report very encouraging results. Ymola has successfully treated a case with the rays. Rydegier³ has had an exceptionally extensive experience with the disease; he has had fourteen cases, and claims to have cured many. He uses the rays both

¹ Loc. cit.

² British Journal of Dermatology, November, 1908, p. 369.

³ Berliner klinische Wochenschrift, January 25, 1909.

externally and in the nose and mouth, giving treatment daily for sixteen days, then resting for sixteen days, and then repeating the same. He employs a medium soft tube and two to three amperes of current. One case he regards as completely cured, there having been no recurrence in five years. Brault¹ had a case that had been operated on several times without result, that improved greatly under the rays. Kenyon,² on the other hand, reports a case in which the rays failed completely.

I can only reaffirm the position as to treatment taken two years ago.³ Surgical measures are at best merely palliative, unless the disease is so circumscribed that the entire mass can be removed; and the same is to be said of dilatation of stenoses, tracheotomy, etc. A large proportion of these tumors seem to retrogress markedly under the x -rays, and I advocate its use in these cases. I hesitate to indorse Rydegier's advice as to the use of the ray on the mucosa. I have seen the most terrible results from its employment for carcinoma and other affections in such tissues, and more than one in which the patient's demise was materially hastened and by no means rendered easier by the added and violent radiodermatitis that was set up. It is certainly my present opinion that if the mucous surfaces are to be treated at all it is safest to do it with the direct application of the tube known as the Cornell, applied directly to the surface of the affected membrane.

Ringworm of the Nails. In last year's review⁴ I expressed my generally adverse opinion to the employment of the x -rays in these affections, at all events in ordinary cases. The persistent use of sulphur ointment, of Wilkinson's modification of the same, of pyrogallol, together with scraping or even removal of the nail, is usually preferable. Sometimes, however, the patient objects to the trouble or radical nature of these methods, and sometimes also they fail us. In these cases radiotherapy may be tried. Schindler⁵ reports good results from it in a case in which all ten finger nails were affected, and which had resisted the most careful specialist treatment for over a year. It was cured by the rays. It was necessary, however, to get a marked erythema of the finger tips; and Schindler emphasizes the importance of watching the hand during the sessions, so that the entire area is evenly treated. The sessions lasted 15 to 45 minutes; a Kirschmann monopolar tube of medium softness at 12 centimeters' distance from the skin, with 2200 interruptions, 1.5 amperes, and 0.5 milliamperes, in the secondary current being employed.

Personally I use only the small Cornell tubes recommended by Geyser for my x -ray work; they are placed in direct contact with the skin, it being held that the air between the patient and the tube, acting as a

¹ Bulletins et mémoires de la Société de chirurgie de Paris, December 8, 1908, p. 1195.

² The Laryngoscope, March, 1909.

³ PROGRESSIVE MEDICINE, September, 1907, p. 120.

⁴ Ibid., p. 126.

⁵ Deutsche medicinische Wochenschrift, 1908, No. 21.

dialelectric, occasions the undesirably violent reactions that sometimes occur. These tubes are certainly safer than the larger ones; I have never caused more than a moderate erythema with them, and Geyser claims that a burn cannot be occasioned from their use.

Fig. 34 shows a typical case of ringworm of the nail that I saw this winter; the trichophyton was readily demonstrated in the scrapings.



FIG. 34.—Ringworm of the nail. (Dr. Gottheil's Case.)

Scabies Treatment. Burke¹ has made a useful review of the various methods of treatment of this very common affection in the various European hospitals and armies. The Parisian "cure while you wait" consists of: Scrubbing with green soap and a hard brush in a tub of hot water for one hour; drying; application thoroughly of an ointment composed of equal parts of flowers of sulphur, potassium carbonate, and lard; meantime the clothes of the patient are baked; the salve remains on twenty-four hours; the treatment is very effective, though severe. In London the patient is soaked for fifteen minutes in a bath composed of 4 ounces of potassium sulphide to 30 gallons of water, taken out and scrubbed with a stiff brush, then soaked in the bath again for fifteen minutes more; the clothes are baked; three baths are usually

¹ American Journal of Dermatology, November, 1908.

needed. In Vienna, the Hebra-Wilkinson ointment—flowers of sulphur, 15 per cent.; oleum rusci, 15 per cent.; green soap, 30 per cent.; creta preparata, 10 per cent.; lard, 30 per cent.—is used once daily for 4 or 5 days until desquamation occurs; then the patient is given a bath. In the Italian and German armies the entire body is varnished with Balsam of Peru for several consecutive days; no harm comes from the application. In the English army the treatment is: A hot bath, followed by varnishing of the body with balsam of Peru, 3 ounces; glycerin, 1 ounce; in twenty-four hours a bath is given; treatment is successful in a few days.

It may not be out of place to describe the treatment that I employ, and which has done me good service for many years. A prolonged soaking in the hot water bath and scrubbing of the body with green soap, and a not too hard flesh brush at night; drying of the body; thorough inunction of the entire body with:

	Parts.
Balsam of Peru	2
Sulphur lotum	1
Olive oil	5
(Applied well shaken.)	

The patient then goes to bed; and he keeps on the same underclothes and nightclothes during the entire treatment. In the morning, the body is thoroughly powdered with flowers of sulphur, some of which is shaken into the underclothing, stockings, etc. This treatment is kept up for a few days; if dermal irritation occurs the sulphur is left out of the mixture and zinc oxide substituted. Cure is usually effected in a few days. For women and very sensitive patients I use the diluted balsam alone, as they object sometimes to the sulphur. As a dusting powder it does not seem to annoy them.

The Tuberculides. I have paid a good deal of attention in previous reviews to the various tuberculoses of the skin and their treatment; but my consideration has been confined to the direct and recognized tuberculous affections of that organ, lupus vulgaris, tuberculosis verrucosa, tuberculous ulceration, scrofuloderma, etc. Of late years, however, a different class of affections has gradually been brought into closer connection with these true tuberculoses under the designation of tuberculides. We owe the name to Darier, who believes very positively in this etiological relationship. Hallopeau and others claim that they are not caused directly by the bacillus, but are occasioned by its toxins, and calls them toxituberculides; a large number of dermatologists, however, still consider the entire matter sub judice. The name is now commonly employed, however, and a brief consideration of the subject will not be out of place.

In general the skin affections called tuberculides may be described as eruptions that look like acne, but differ from that affection in being

on the body rather than on the face, in being very indolent and persistent, in leaving pigmented scars, and in not occurring almost exclusively, as acne does, in adolescents. Two chief forms, acnitis and folliclis, are to be mentioned; in addition to this certain other affections, erythema induratum, acne necrotica, and even lupus erythematosus, are reckoned by some as belonging to this group. Acnitis occurs on the face and limbs as pinhead-sized or smaller solid brownish red papules and nodules, sometimes slowly becoming pustular, and often closely resembling ordinary lupus vulgaris nodules. The lesions are often grouped; they last for a long time, and leave pigmented scars; and they are entirely recalcitrant to ordinary acne therapy. Folliclis is more frequent on the limbs, hands, and feet, and appears as inflammatory red papules which soon become vesicopustular and dry up with an adherent, horny, plug-like centre. There is no tendency to grouping; the lesions come out in crops for years; and like acnitis, they leave scars and are unaffected by ordinary treatment.

As regards therapy, I believe that destructive measures, the galvano-caustic point, solid carbon dioxide, or the mineral acids, should be employed for these lesions. They result in scarring anyhow, and treatment merely hastens the inevitable termination. The tuberculin injection treatment may be tried, though I have no great confidence in it; and, of course, in possible tuberculous affections such as these the usual general and hygienic methods of treatment must not be neglected.

SYPHILIS.

Animal Syphilis. It is now recognized that syphilis, formerly supposed to affect the human race alone, is transmissible to certain animals. The admission of this fact is not based on the symptoms that infected animals show alone; these are liable to misinterpretation, and may be expected, indeed, to differ very considerably from those in man, thus invalidating our only criteria in the past in determining the presence of the disease. Previous to the discovery of the spirochete the general opinion was that, in view of the negative inoculation results of many competent observers, the reported positive ones were not definite and uncontrollable enough to be accepted. It is proved now, however, by the finding of the spirochete in the lesions, that positive inoculations can be made in certain animals.

The latest addition to the list of susceptible animals is the mouse. Siegel,¹ in a preliminary communication, details the results of his inoculations of two-day-old mice both cutaneously and subcutaneously with the syphilitic virus. In a certain number of the animals there appeared in a few weeks at the site of the inoculation small hard nodules;

¹ Centralblatt f. Bakteriologie, vol. lxxviii, No. 5.

other animals showed disturbances in the development of the hair and red spots on the skin. Three of the animals most severely sick were killed, and used for inoculations on apes. In some of these there developed a typical primary lesion, exactly similar to those that have frequently been seen after the inoculation of these animals with highly virulent human material. Further inoculations from the infected apes gave similar lesions in other monkeys.

Aside from its scientific interest, investigations of this nature are important, inasmuch as they tend to show the possibility, at all events, of extra-human syphilis transmission. If, under certain circumstances, animals that human beings come into occasional contact with can either contract the disease or act as its carrier, it may help us to understand some of the as yet unaccountable infections that occur. It is within the experience of all of us, very probably, to meet an occasional case of undoubted lues, early or late, in which absolutely no point of infection can be found, and in which the mode of origin of the disease is a complete mystery.

Lung Embolism after Mercury Salicylate Injections. I have repeatedly advocated in these pages and elsewhere the treatment of syphilis by intramuscular injections, especially of the insoluble mercurials; and I have described the technique at length.¹ A good deal of attention has been paid, both in home and foreign journals, to certain accidents and possible disadvantages; and I have carefully investigated not only my own records and those of my assistants at various clinics, but also other reports, and especially the encyclopedic report of Laserre,² in which practically all the recorded cases of untoward occurrences has been collected. Now, it must be admitted at the outset that the introduction into the human body of a mineral poison in quantity can never be a matter of indifference; and this no matter by what route it is administered. Possible abnormal susceptibility to the effects of mercury is a factor that must always be reckoned with. Serious accidents and deaths have occurred from mercury administered by the mouth and by inunction, as they have from diphtheritic antitoxin injections; and the questions before us in the one case as in the other are: Are such accidents unavoidable; in what proportion do they occur; and are the advantages of the method sufficient to counterbalance them?

It will not be possible within the bounds of such a review as this to go into these questions in detail; that must be reserved for future and more elaborate consideration. Suffice it to say that, as the result of an experience with the insoluble injections at least as extensive as any one here that I know of, I can say that, in an overwhelming majority of cases the accidental and undesirable effects of the injections are avoid-

¹ PROGRESSIVE MEDICINE, September, 1903, p. 177; September, 1904, p. 147; September, 1905, p. 135; September, 1906, p. 143.

² Annales de Dermatologie, May, November, December, 1908.

able; that the proportion of cases in which they do occur is smaller than that from serum injections and other commonly used procedures; and that the advantages of the method over ingestion and inunction are so great from every point of view that almost all syphilographers the world over use mercurial injections in one form or another.

I shall consider in some detail, however, the occurrence of pulmonary embolism after the injections, for the reason that it is not only so very much the commonest of their possible deleterious effect as to be practically the only one, but also because it has been the subject of a number of recently published objections to it. I maintain that it need never occur; I have not only never had one myself, but I have never seen one in the hands of my assistants. Without having figures at hand, I have certainly averaged 1000 for ten or more years. My assistants have treated a greater number; and the occurrence of embolism has been reported to me twice. It is quite possible that the technique was not perfect in these cases, since the injections are usually made as part of the routine work by the newest and youngest members of the staff. About once in every 20 to 30 injections made personally, by myself, I find that I have entered a vein, and withdraw the needle. This varies in a quite unaccountable way. Sometimes I will work for days or weeks without encountering a vein introduction; and then two will occur in one morning. I have once, in the case of a physician, on two successive punctures, entered a vein each time, and have had to make a third insertion.

All reports agree, however, that embolism, if it does occur, is not a serious accident. The patient coughs violently for a time, has some pain in the side, and perhaps expectorates a little bloody mucus; but he recovers entirely in a few hours or a day. But, as I have indicated above, pulmonary embolism need not occur. It only happens when the open lumen of the needle is engaged in a vein; transfixion of veins, as shown by the oozing of blood from the puncture after the injection, is of common occurrence and of no significance. There being a certain blood pressure in the veins, with the exception of those connected with the thoracic cavity, the column of mercurial suspension in the needle cavity acts as a manometer, and shows when it is in direct continuity with it. If the needle is detached after insertion it can be told in a minute whether the implantation is safe. I have insisted in a recent article¹ that certain conditions must be observed to render this precautionary test reliable. An inaccurate or hasty test is worse than none at all. I would emphasize the following:

1. The needle, when plunged into the tissues must be full to the tip with the suspension, which remains in it when the two parts of the instrument are disconnected; thus, even the cap contains the oily mixture, and there is a solid column of fluid between the distal opening of

¹ *International Journal of Surgery*, February, 1909.

the needle in the depths of the tissues and the exposed and visible proximal interior of the cap. The fluid in this latter will have a concave visible surface from capillary attraction of the metal walls on the fluid. The least flattening out of this concavity when carefully watched for, say thirty seconds, not to speak of its slow bulging forward into a convexity, is proof of the existence of pressure at the needle point; and this can only be exerted by the blood in a vessel. It is the signal for the immediate stoppage of the injection at that point. It is not only unnecessary, but improper to wait until the suspension in the needle is forced out or until blood flows from the needle. The location of the needle point as regards the vessels can be judged much more quickly and delicately.

2. The needle point must not be displaced during the manipulations. It should be plunged hard into the tissues right up to the hilt, so that the shoulder rests firmly on the skin; and the connection between the needle and the syringe should be of the slip-joint variety, permitting ready and undisturbing disconnection and reconnection. If the position of the needle point is changed in the reapplication of the syringe after the lumen observation is made, the value of this safety test is naturally lessened. Transfixion of veins by the needle plunged blindly into the tissues is necessarily of frequent occurrence, and is shown by the oozing of blood from the puncture after the injection is made and the needle is withdrawn. It is of no consequence at all, since the pierced veins are closed by the transfixing needle shaft while the injection is being made, and the tissues contract and close up after the instrument is withdrawn.

3. The lumen of the needle must be perfectly patent. If it is partly obstructed by an accumulation of imperfectly emulsified salicylate there may be sufficient resistance to the comparatively slight blood pressure to prevent any very apparent or rapid forward propulsion of the suspension. On the other hand, the pressure exerted through the piston is very much greater, and may force the fluid through a partially occluded needle, while the slight venous pressure does not. Hence, the rules that I always insist on: The fluid in the cap must be watched very closely for half a minute before the safety of the implantation is decided on; the injection itself must be made very slowly and gently; and the least obstruction to the easy and steady outflow of the suspension under piston pressure is the signal for the stoppage of the procedure.

These may seem very minute precautions; but I attribute the fact that I have never encountered an embolism to their observance. My experience leads me to believe that the embolisms that do occur are due almost entirely to their non-observance.

Syphilis and Nervous and Mental Diseases. Syphilis of the nervous system was last treated of in these pages in 1902;¹ it has been consider-

¹ PROGRESSIVE MEDICINE, September, 1902, p. 211.

ably discussed during the past year, and several of the articles on the subject deserve attention. Neft¹ emphasizes the great importance to the patient of an early recognition of the luetic basis of the trouble; the ultimate prognosis being largely dependent upon it. In their early stages syphilitic affections of the nervous system, even if very severe, are more or less amenable to treatment; in their later stages, however, when gross changes have taken place in the nerve structures, few of us can boast of the successes claimed by Leredde, who has relieved and cured patients showing all the symptoms of advanced tabes. Recognition of the specific nature of the trouble is not, however, easy; the history, which most men rely upon, helps us but little; a man who has had syphilis may have a non-luetic psychosis or neurosis, and many patients forget or do not know that they have had the disease. The presence of signs of florid or past syphilis will help us. Erlenmayer lays stress on the great variety of the pains and disturbances, the localization of these latter in the extremities and the head, their increase on pressure, and their nocturnal exacerbations. Suspicious symptoms are a gradually increasing psychic change, so that the patient becomes indifferent to his nearest relatives and to his most important business. He becomes readily fatigued both bodily and mentally, until he falls into a marked condition of general debility without any evident physical cause.

Gordon² reviews the entire subject in an elaborate article. He repeats Nonne's estimation of 1 to 66 as the proportion of syphilitic to other nervous diseases; a good many writers, and I agree with them, regard this as entirely too low. Nervous syphilis is by no means, as is commonly supposed, exclusively characteristic of the late or tertiary stages of the disease; it may occur very early, even immediately after the chancre. This latter form, which may for convenience be called *cerebrospinal syphilis*, is the direct result of the infection, and as much a part of its symptomatology as the general eruptions, and amenable to the regular treatment; the former or late form may be called *parasyphilis*, since the changes are the result of a process that has run its course, and are unfortunately recalcitrant to treatment in the vast majority of cases.

In cerebrospinal syphilis both brain and cord are most often involved together, though the cerebral symptoms are usually more marked than the spinal. They assume two chief forms. There is either a diffuse inflammation, with the characteristic syphilitic involvement of the vessels, a meningo-encephalitis, with exudation. The base of the brain is especially affected, and the cranial nerves, most often the optic and the oculomotor, suffer. Hemorrhages and softening, with paralysis, aphasia, amblyopia, etc., occur, the clinical picture varying with the site of the lesion. Headache is the earliest and most constant first

¹ Inaugural Dissertation, Bonn, 1908.

² Monthly Cyclopedia and Medical Bulletin, April, 1909.

symptom. General apathy and indifference may finally deepen into stupor and coma. In some cases the condition is just the reverse, there is excitement, delirium, and general convulsions. This depends on the acuity of the process. When this is very chronic the psychic disturbances are more prominent. There is mental feebleness, amnesia, and, in advanced cases, dementia. The spinal cord symptoms are chiefly pains along the spine and radiating into the limbs, numbness and tingling, paralysis, and later spastic palsy.

Gordon lays down the following criteria for the diagnosis of cerebral syphilis of the early type:

1. Sudden onset of cerebral symptoms in an individual in apparently good health.
2. Headache of a special form (nocturnal).
3. Palsies of cranial nerves.
4. Hemiplegia, monoplegia, focal or generalized epilepsy.
5. The course of the disease; disappearance and reappearance of symptoms, their brief duration; multiplicity of symptoms.
6. Disappearance or prompt amelioration of symptoms under the influence of mercury and the iodides.

The later form of syphilis of the brain and cord consists essentially in the formation of gummatous tumors in the nerve structures, with all the varied symptomatology incident thereto.

The parasyphilitic affections may be generalized as paresis when the brain is chiefly involved, and locomotor ataxia or tabes when the disease has affected the spinal cord.

The peripheral nerves are frequently affected in syphilis, especially in its earlier stages. Syphilitic endoneuritis and perineuritis, obliteration of vessels and subsequent degeneration of nerve fibers, with neuralgias and neuritis in various forms. The symptoms are indistinguishable from those of these affections from other causes; and Gordon admits that the effects of treatment is the chief criterion.

The psychoses of early syphilis are toxi-infectious, due to the specific poison and not to central lesions caused by syphilis. As with the mental symptoms of other toxemias, the onset is sudden. Headache, insomnia, hebetude, stupor, mental obtuseness, delirium, hallucinations, and delusions, and all the symptoms of delusional insanity occur. They are very amenable to specific treatment. The late psychoses are due to the precedent meningo-encephalitis and endarteritis, and usually accompany motor symptoms, epileptic and apoplectic attacks, palsies of cranial nerves, etc. Dementia gradually supervenes, or paresis.

Gordon concludes that of all organs and tissues, the nervous system is the greatest sufferer in syphilitic individuals; Fournier found that system affected in 1085 out of 3429 cases of tertiary syphilis. He emphasizes the importance of hygiene, diet, avoidance of all excesses, regular living, etc.; for it is apparently the patient's general condition

rather than any other factor that we know of that determines whether or not his nervous system becomes affected. Prevention, always more important than cure, is of especial significance here; for while the successes of the regular treatment in many cases of cerebrospinal and mental syphilis are marked, in unfortunately the majority of them our efforts are of partial avail only, or entirely ineffective.

Pritchard¹ views the same subject from a somewhat different point. He lays especial stress on the faculty for simulation shown by nervous syphilis, saying that there are less than a dozen of the disease entities of the central nervous system that has not its clinical analogue in a specific pseudoform. Nevertheless, there are certain ear-marks of the specific nerve disease which have stood the test of the author's twenty years of experience and have been satisfactorily applied in many hundreds of cases. The syndrome is as follows:

"Given a patient between the ages of twenty-five and forty-five, affected with any form of intracranial paralysis or cerebral disturbance, which was preceded by headaches of nocturnal onset or exacerbation, associated with vertigo and insomnia, the insomnia occurring during the first half of the night, the paralysis developing during sleep, both headache and insomnia disappearing upon the onset of the paralysis, the cause is syphilis."

Of course, no single symptom is pathognomonic; but what he calls "the nocturnal aggressiveness" of nervous syphilis has always seemed to Pritchard a most interesting and significant phenomenon. The focal palsies, especially hemiplegia, often occur in sleep; the various pains are always worse at night.

As regards the prognosis, the author makes a few broad generalizations. The nearer the syphilitic accident is to the primary disease the better the prognosis. Associated constitutional alcoholism and all states of arterial degeneration affect the outcome unfavorably. There is no inherent tendency to either spontaneous recovery or arrest of progress. The prognosis is therefore peculiarly related to and dependent on prompt diagnosis and proper treatment. The more highly organized in function is the attacked neuron, the more permanent the residual damage. Prominent psychic symptoms are therefore of unfavorable significance. Central neuron tissue once having been destroyed is not regenerated; hence, softening after syphilitic hemorrhage, thrombosis, or obliterating endarteritis means permanent loss of function. Constitutional vigor and organic soundness elsewhere are less favorable as factors modifying the general outlook than is usual in medicine. One of the most positively harmful of the general aggravating factors is an atmosphere of worry, anxiety, or depression.

As regards treatment of nerve syphilis, Pritchard prefers the inunctions

¹ *New England Medical Monthly*, April 1, 1909.

to intradermic medication; among neurologists especially he is in the minority in this opinion; for they more than other syphilographers, I think, have adopted the newer methods. He gives the iodides, as is proper, in doses that are only regulated by their effect; and he disregards iodism in its ordinary manifestations, persisting in the medication in spite of it. The kidneys should be watched, of course, when large doses of these drugs are being administered, once in a long while nephritis consequent upon the medication forming a therapeutic indication that cannot be neglected.

The Origin of Syphilis and of its Name. In spite of the many volumes that have been written on these subjects, it can hardly be claimed that all the moot points have been settled. As is well known, the disease was recognized as an apparently new affection by European physicians shortly after the time that Columbus discovered America; and its ravages were such as we might expect from the infection of a virgin soil. It spread rapidly over the Continent; its type was of a severity that is hardly seen at all today; and its direct mortality was enormous. Similar occurrences have been noted when other infections, usually very mild, have reached isolated communities that have been protected for generations; as when the Hebrides in the last century had their first measles epidemic. It chanced that shortly after Columbus' return the French were besieging Naples, and the disease broke out both in the beleaguered city and in the hostile camp around it. With the international courtesy characteristic of the time, each nation accused the other of being responsible for it; and the French called it "*le mal de Naples*," whilst the Italians designated as "*le mal Française*." Both names, especially the latter, stuck; and "*the French evil*" is to this day a gradually disappearing synonym for the disease. Later investigations have, of course, disproved all such accusations; but the idea of the American origin of the disease has kept its ground, and is to this day held by some authorities. Certain it seems that a virus of unusual activity was introduced into Europe at that time, as we see even today variations in this respect. Many of the very severest and most malignant specific infections that I have ever seen have been in sailors and travellers who have acquired them in Eastern Asia, South America, etc. A disease with as marked and evidently connected a sequence of symptoms as the syphilis of the fifteenth century could not have escaped the observation of physicians in the preceding decades. A mild and attenuated malady, like most of the syphilis that we see today, could well have been misinterpreted in those earlier times.

Another factor is of especial interest in this connection. Just at the time that syphilis became recognized as a disease entity, and began to attract the attention of physicians, another and very similar infection seemed to disappear from the civilized world. Leprosy had been endemic for centuries, and was so common that knightly orders were

established to care for the patients, and in England alone, with a population of possibly a million or two, there were no less than 400 houses devoted to the care of these unfortunates. Leprosy was absolutely forgotten; it was no longer mentioned even in the text-books; and it was only rediscovered in the middle of the last century, when Scandinavian physicians found it still present, and discovered its etiological agent. We know now that it still occurs everywhere, but the cases are few in Europe, and its form is mild.

It is not within the bounds of this review to discuss this question at any length, to inquire as to any possible relationship between the two infections, or as to whether they may not have been confounded, the same manifestations being called leprosy in one age and syphilis in another. Knott¹ has gone into the subject at some length in a recent paper. He concludes that there are no valid reasons for believing that syphilis was brought from Haiti to Europe by Columbus' sailors. The extensive and devastating wars that were prevalent in Europe at that time account, in his opinion, for the phenomenal spread of lues, and the vastly improved opportunities for clinical observation led to the correlation of isolated observations until the concrete idea of the *morbus gallici* was obtained. Even the older writers, Avicenna, William of Saliceto, Lanfranc, John of Gaddesden, etc., record affections that we must regard as parts of the syphilitic disease. In 1302, diseases of the sexual organs were so common in Venice that a fine of 20 soldi was imposed on any person who could be proved to have transmitted them. Knott inclines to the opinion that the cause of the sudden lighting up of sexual disease that coincided with the discovery of the new world, and which stimulated the epic muse of Hieronymus Fracastorio, was the fact that the disease was implanted on the soil of a new race, and so acquired fresh virulence. To Fracastorio also we owe the name of syphilis. We have now indubitable proof that syphilis as well as the other venereal diseases was prevalent in various parts of the ancient world in the earliest historical times. Thus, André Thevet reports that the "French disease" had always been endemic in Senegal; Bownius found that it had always been well known in Amboyna, the Moluccas, Java, etc.; the Chinese physicians have known it from the earliest times, and their oldest medical books mention it as an ancient disease. The author's conclusion is one that I regard as entirely correct; syphilis is a disease that has been known as far back as human history extends; but the infection, probably at the time as mild or milder than it is with us today, received a special impetus at the end of the fifteenth century in Europe, due to the extensive mingling of races occasioned by the crusades, the geographical discoveries, etc.

Syphilis Hospitals. It is probably true that the type of syphilitic infection as we see it today is less severe than that which was common

¹ New York Medical Journal, October 31, 1908.

a generation or two ago. This is, of course, a matter of general impression only, since exact information on the subject would be difficult and perhaps impossible to obtain. We do not see by any means so many of the malignant cases as we did a generation or two ago; a fact that may be due to some gradual attenuation of the virus, or to improved methods of diagnosis enabling us to recognize the disease earlier or to better modes of treatment by which we treat it more efficaciously, or all three factors. Nevertheless, severe cases occasioning extensive mutilation and deformity are sufficiently common; and with the extension of our pathological knowledge the boundaries of the after effects and ultimate consequences of the infection are ever being enlarged. We are becoming increasingly aware of its deep-seated and often ineradicable effect on the arterial system and all the internal organs; and it is hardly too much to say today, that as a life shortener and a population decreaser, the spirochete can almost compete with the tubercle bacillus. The actively infective period is shorter, it is true, with the former than with the latter organism, but it is much more active while it lasts; and, in view of the results attained by modern phthisiotherapy in the tuberculous infection, treatment is probably as efficacious in the one case as in the other.

A large proportion of our syphilis patients are distinctly hospital cases. While they are not usually disabled, and can and do continue to work, they are a danger to the community and unwittingly spread the disease, and their treatment is of the inefficient and insufficient ambulant variety in the great majority of cases. Syphilitics, especially in the earlier and most dangerous stages of the affection, are not received in almost all our hospitals. The contagious nature of the affection is the ostensible reason; but the real one is the persistence of the old prejudice that regards the syphilitic infection as a disgrace, as a punishment for wrongdoing rather than as a disease and a misfortune. I need not here, to a medical reader, insist on the injustice and even the absurdity of such a viewpoint.

These considerations have been aroused by some recent articles by British army medical officers detailing the methods employed by them to cope with the disease and to prevent its spread. Some interesting statements are made by Major French¹ regarding the conditions in London. In that city of 5,000,000 inhabitants there are just fifty beds devoted to the in-patient treatment of all venereal diseases. As the result of this defect, he says, venereal disease is sown broadcast among the population, and the resulting insanity due to syphilis is dealt with in lunatic asylums maintained at an immense cost by the State. Further, the out-patients are often underfed, live under bad hygienic conditions, etc.; but above all they take their treatment as they like, and when they

¹ British Journal of Dermatology, November, 1908, p. 356.

like. Colonel Lambkin¹ says that the great hospitals make no attempt at really curing syphilis; and that in ninety-nine cases out of a hundred in England at the present time the treatment is one of symptomatic amelioration only, and no real attempt is made to deal with the disease.

Conditions in America, so far as my observations go, are no better. In Greater New York, with a population of upward of 4,000,000, the City Hospital is the only institution where syphilitics have the right to go; and even there there are no wards for them; they are taken in the Dermatological and the Genito-urinary Wards. All told, not more than some sixty beds are available for them. Acute early syphilis goes into these wards, whilst syphilis of the eye, brain, or internal organs goes to the appropriate divisions. I am not aware that provision is made for these patients in any other American city.

I do not favor the radical measures advocated in some quarters, which would rank syphilis as a compulsorily notifiable disease, and would place its treatment, in certain classes of the population at all events, in the hands of the authorities. Even in view of all its dangers and damage, this involves a degree of interference with personal liberty that is unjustifiable; and it would be entirely ineffective in a malady in which both the incentives to secrecy and the chances for its maintenance are so great. But I do believe that adequate provision should be made for all cases that are willing to undergo hospital treatment; and that dispensary physicians and those whose work brings them in contact with the poorer classes of the population especially should explain to their patients the serious nature of their infection, and urge them to submit, during the acuter stages of the disease at all events, to a thorough hospital treatment.

A city like New York should have at least 250 beds devoted to syphilitic patients; and the syphilis division should get not only the syphilis of the genitals and the skin, but also, as far as possible, the syphilis of the mucosæ, the bones, the internal organs, the eye, heredosyphilis, etc. As things are now, these later and deeper seated luetic affections are seen only occasionally and incidentally by syphilographers, and anything like a complete study and extensive experience in all phases of the infection is impossible. It would be quite possible to arrange for the proper coöperation of specialists that would be required in these various lines.

Unusual Chancres. Selenew² reports a case in which the sclerosis, at the usual place, was wholly coated with a black adherent crust, under the name of black chancre. In all other respects, except its color, the lesion presented nothing abnormal. He has seen six of such cases during the last ten years—three on the upper lip, two on the penis, and

¹ The Hospital, June 29, 1907.

² Archiv f. Dermatologie, November, 1908, p. 260.

one on the scrotum. In three of these cases he found a parasite in the scrapings from the tumor, a protozoön, growable on potatoes. He has found the same parasite in non-syphilitic lesions, notably on an ulcer of the leg that had been diagnosticated as blastomycosis. I have seen this "black chancre" a number of times; and I append an illustration of one observed some time ago (Fig. 35). It is noteworthy that in three of Selenow's cases, as in the one here figured, the lesion was extragenital; which would tend to show that the parasite accidentally implanted on the initial lesion may possibly come from the food.

A chancre of the penis at an unusual age is reported by Metschtscherski, and Sokolow.¹ The patient was aged thirteen months. House and village epidemics of syphilis seem rather common in Russia, to

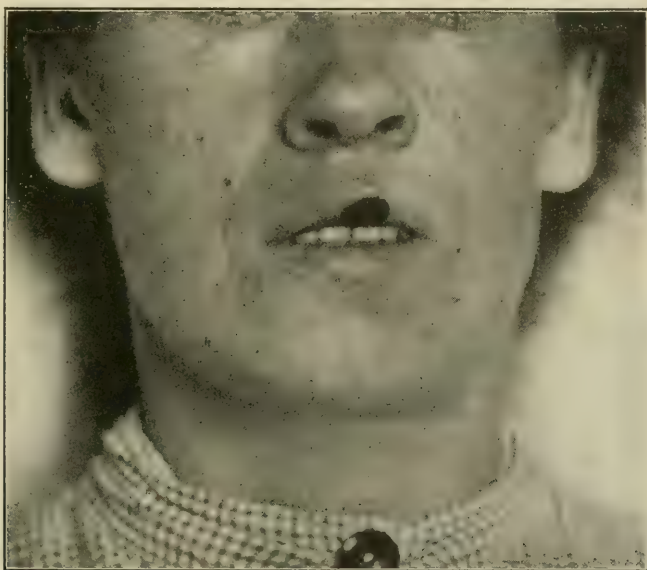


FIG. 35.—Black chancre. (Dr. Gottheil's case.)

judge from the reported cases; and when a number or all the members of a family are infected, the chances of extragenital infection from buccal mucous patches, etc., are great. I have myself reported a house epidemic of the kind some years ago,² in which all the members of a family, ten in number, were infected. The disease was brought into the family by the eldest child, a girl, aged fourteen years, who contracted it in the ordinary way. She infected the vaccination wound of the youngest child in the family, a boy of two years, still nursing. This infant gave his mother a chancre of the nipple; and so, in the course of a year, the

¹ *Russische Zeitschrift f. Haut. und Venerische Krankheiten*, December, 1908.

² *New York Medical Journal*, March 26, 1898.

disease spread through the entire family, the father, strange to say, being the last to acquire it. I have also recorded a chancre of the forefinger in an infant aged seventeen months;¹ the mother was syphilitic, and had mucous patches. As regards the origin of the infection in Metscherschki's case, it is readily explained by the habit prevalent among the peasantry of eastern Europe, of attempting to treat many local affections by buccal suction or saliva.

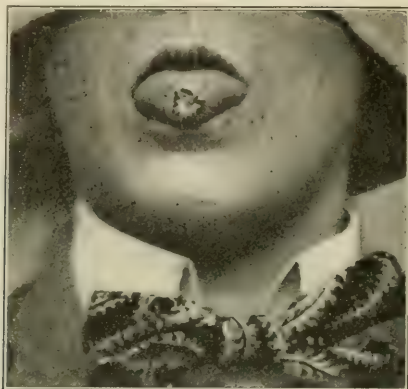


FIG. 36.—Chancre of the tongue. (Dr. Gottheil's case.)



FIG. 37.—Chancre of the finger. (Dr. Gottheil's case.)

I append to this article two interesting examples of extragenital infection. Fig. 36 was a chancre of the tongue occurring in a young girl. She was entirely ignorant of the nature of her affection; but she stated that the young man she had been "keeping company" with had had a sore mouth. Fig. 37 is a chancre of the right middle finger, that I had in my City Hospital service three years ago. The young man had been out with his sister, and, resenting some remarks about her, had knocked a man down, cutting his knuckles on his teeth. The result was apparent two months later when the photograph was taken.

¹ Southern Medical Record, May, 1899.

The Serum Diagnosis of Syphilis, or the Wassermann Test. Since the discovery of the spirochete and the proof, now fairly certain, of its position as the etiological factor of the disease, no one subject in connection with the disease has excited such general interest as the so-called Wassermann test, which reveals the presence of the disease even in the absence of symptoms. Its importance cannot be overestimated. In spite, however, of the numerous articles in the journals and the demonstrations before the medical societies, my observations lead me to conclude that the ideas of the practitioner on the subject are still so extremely hazy that he practically knows nothing about it but the name. This is partly due to the undoubted fact that the subject is a complicated one, and involves the employment of a number of new and imperfectly defined terms; but it is also due to the presupposition on the part of the lecturers and writers of a considerable amount of knowledge of the phenomena of hemolysis and the principles of serum diagnosis.

The reaction depends essentially on the property of dissolving the red blood corpuscles (hemolysis) that the blood serum acquires under certain conditions. A number of substances added to the blood under investigation will give it this property; among which I may mention the blood of an animal of another species, bacterial extract and certain proteid poisons. All such are called "antigens;" and they occasion the appearance in the treated blood of another substance known as the "antibody," or the "amboceptor." To get the reaction, all three bodies, the hemolytic agent, the antigen, and the antibody or amboceptor must be present; and, of course, a diagnosis may be made either positively, by its occurrence when all three are present, or negatively, by its absence when one or more are wanting.

An example may serve to elucidate these facts. If to 1 c.c. of a 5 per cent. suspension of sheep's blood corpuscles in normal saline solution one drop of normal rabbit's blood serum is added, and the mixture is kept at 37° C. in the incubator for an hour or two, the blood corpuscles will be found in a thick sediment at the bottom of the test-tube, with clear supernatant fluid; hemolysis does not occur. If, however, the drop of rabbit's blood serum is taken from an animal which has had some sheep's blood injected into it previously, either intravenously or intraperitoneally, the vessel subjected to the same treatment will contain no sediment; the corpuscles will be "laked," and the entire blood will be red, but transparent; hemolysis has occurred.

In other words, the serum of the rabbit that has been treated with sheep's blood, has acquired the faculty of hemolyzing sheep's corpuscles; it is "active" serum. It may be made to lose its hemolyzing faculty by heating it at 55° C. for half an hour; but this serum "inactivated" by heat is not normal serum. If a drop of normal serum is added to it, though neither the "inactivated" nor the normal serum is active alone, it becomes hemolytic like the original active serum. Hence there must

be in the active serum two bodies which occasion hemolysis; one present in normal serum and destroyed by heat, the "complement," and another one not destructible by heat, the "amboceptor." The entire circle of the reaction therefore includes the antigen, the amboceptor, and the complement.

One further term requires definition, and that is the "fixation" of the complement. By this is meant the union of the complement with the amboceptor and antigen. When that occurs no free complement is present, and hemolysis does not occur. Hence, by adding a solution containing complement to the inactivated serum supposed to contain the antigen, the occurrence or the non-occurrence of hemolysis may be used to determine whether the complement is free or fixed; in other words, whether the antigen is or is not present.

Now, in employing a test of this nature the proper antigen to use is an extract from the cultivated microorganism of the disease; this can be done with tubercle, typhoid, etc., which can be cultured, but not with syphilis, since we have not as yet succeeded in growing the spirochete. Wassermann employed in its stead extracts of organs in which the spirochete is always abundant; and he found that an extract made from the liver of a stillborn syphilitic fetus gave the best results.

If the serum to be tried is syphilitic, it contains the complement as well as the antibody; it is therefore "inactivated" by heat to get the antibody alone. On the addition of the above test fluid under proper conditions, the hemolytic circle is complete, and hemolysis occurs. If the serum to be tried is non-syphilitic, the circle is incomplete, and hemolysis will not occur.

This, reduced to its simplest terms, is the Wassermann serum reaction for syphilis. Its practice, however, is an extremely complicated and delicate matter. Not only must the sera and extracts be carefully and skilfully prepared, but even the drawing of the serum from the patient to be tested must be done in a definite and exact manner. A system of controls must be employed in all stages. The method, therefore, can only be employed by a professed biologist; and even for such an one both Wassermann and Bruch state that it takes three or four weeks' hard work to become moderately proficient in it. It can, therefore, only be employed in the laboratories and by those who have made a special study of the reaction.

The practical diagnostic value of the test has occupied the attention of many observers during the past year. Extensive studies have been made with it on apes by Neisser, in Java, with the general result that they never give the reaction unless infected; that the presence of the antigen can be demonstrated in the organs of infected animals within seven days after inoculation, long before the chancre appears; and that in untreated animals the serum reaction persists indefinitely, even for two and a half years, being strong evidence that the disease never under-

goes spontaneous cure. Mercury, it has further been found, entirely prevents the development of the antigen in almost all the cases; iodine only in about half of them.¹

Interest naturally centres, however, on the results obtained in the human subject. I shall not attempt to analyze all the publications, but shall summarize a few of the more important only.

Meier² reports on 202 cases. Of these, 21 had no signs or histories of present or past syphilis, and every one of them gave a negative result. In 42 cases of primary syphilis, 25 were positive and 17 negative; in 162 cases of secondary syphilis, 84 were positive and 78 negative; in 32 cases of tertiary syphilis, 16 were positive and 16 negative; of malignant syphilis, the figures were 4 and 4; in hereditary syphilis, 4 and 3; in latent syphilis, 36 and 29; in "clinically" cured syphilis, 4, all the cases giving a positive reaction; and in syphilis of the central nervous system, 8 and 6. The percentage of positive results in all these cases was over 85.

Butler³ found a positive result in 90 to 95 per cent. of all cases showing syphilitic manifestations, in 50 to 60 per cent. of latent cases, and in 70 to 80 per cent. of parasyphilitic cases. He believes that the vigor with which antiluetic treatment had been pursued in many of these cases accounts for a large proportion of the negative results. Kroner⁴ records negative results in every case not certainly specific, and 73 per cent. positive results in syphilitics. Fischer⁵ gives figures that approximate those of Kroner closely. Blaschko⁶ with an experience of 500 cases, found not a single positive result where syphilis was certainly absent. In syphilitics the reaction was positive in 90 to 100 per cent. of the cases in the early stages; and even in the late stages where there were external manifestations of the disease. In the latent cases there was a positive reaction in 50 to 80 per cent. The tables of Mayer and Proescher⁷ coincide essentially with these figures. Klausner⁸ got a positive reaction in all but three out of 110 syphilitics. It is needless to multiply these figures; they may be accepted as exemplifying the results obtained by the great majority of the investigators. In their opinion the serum reaction for syphilis is specific.

Conclusions, as drawn from these various investigators and many others, may be stated as follows:

1. A positive Wassermann reaction is a sure sign of syphilis.
2. A negative reaction is of less value, since it may be occasioned by treatment, errors of technique, etc. Over and above these, it must

¹ British Journal of Dermatology, January, 1909.

² Ibid.

³ Journal of the American Medical Association, September 5, 1908.

⁴ Berliner Klinische Wochenschrift, January 27, 1908.

⁵ Ibid.

⁶ Ibid., April 6, 1908.

⁷ Archives of Internal Medicine, August, 1908.

⁸ Wiener klinische Wochenschrift, March 12, 1908.

not be forgotten that the reaction has as yet been found negative in a not inconsiderable proportion of undoubtedly syphilitic cases.

From the purely scientific point of view the reaction is undoubtedly of the greatest importance. It opens up a new method of syphilis investigation, and may enable us to decide many of the moot points in connection with the disease. From the practical standpoint, however, the matter is somewhat different. Its usefulness to the practitioner would lie in the elucidation of the diagnosis, and the consequent furnishing of indications as to treatment. Much that I have said in a previous issue of this review as to the probable practical value of spirochete findings in syphilis holds good here, and in even greater degree.¹ Far simpler and surer means for the diagnosis of syphilis are at the disposal of every practitioner; and these suffice in the great majority of the cases. When there is doubt, the treatment test is one that anyone can apply; and I think that its results are as reliable as that from the serum, so far as it is yet developed. Besides this the serum test is entirely unsuited for general use; in fact, it is only reliable in the most practised and skilful hands. It can only be used by practitioners so situated that they can command the aid of specialists devoted to this line of work. At the present time it is only in a few of our largest cities that that can be done.

Given the conditions necessary for the application of the test, it is apparent that it may be useful under the following circumstances:

1. When there is doubt as to the syphilitic or non-syphilitic nature of an affection or lesion, and an immediate decision is of importance.
2. When a decision as to cure is to be made, as an indication for the cessation of treatment, permission to contract marriage, etc.
3. When there has been exposure to infection, and the entire absence of symptoms renders the treatment test unavailable.
4. When the syphilitic origin of any of the so-called parasyphilitic affections, or the various neurological conditions now regarded as frequent sequelæ of the disease is to be decided on.
5. When the condition of possibly heredosyphilitic children is to be decided on.

¹ PROGRESSIVE MEDICINE, September, 1907, p. 123.

OBSTETRICS.

By EDWARD P. DAVIS, M.D.

PREGNANCY AND ITS COMPLICATIONS.

Prematernity Hospital Practice. In previous papers, Ballantyne¹ has urged the importance of hospital care for cases of pregnancy complicated by disease of mother or fetus. He now reviews the work of the autumn quarter of 1908 at the Edinburgh Royal Maternity and the Simpson Memorial Hospital.

In all, including the out-patients, 443 cases were treated. The actual number of deliveries was 432, an average of 144 for each month, and between 5 and 6 daily. During the quarter there were 3 maternal deaths, a mortality of 0.67 per cent. One of these died in the Hamilton wards for the treatment of morbid pregnancies, from pernicious chorea, in the second month of pregnancy. The second death was a case of incomplete abortion, followed by septic infection.

The third death occurred in the Leith branch, from pulmonary embolism following abortion. These deaths all occurred before or at the middle of pregnancy, which emphasizes the gravity of conditions developing before labor at full term.

In the Hamilton ward, devoted exclusively to pregnant women, there were 30 cases under treatment for complications of gestation; 5 had eclampsia, and 3 were considered in danger of eclampsia, because well-marked albuminuria was present. There were 4 cases of accidental hemorrhage in pregnancy, and 3 of placenta prævia; there were 4 cases of threatened abortion; and 2 of retroversion of the gravid uterus requiring replacement. One patient was admitted because in two previous pregnancies the fetus had died; 2 patients suffered from phlebitis in pregnancy, and one of these had phlegmasia following labor. There were 2 cases of heart disease; 1 of gonorrheal arthritis; 1 of marked contraction of the vagina and vulva; 1 fatal case of chorea; and 1 case of hydramnios with twins. One of the albuminuric patients had also a twin pregnancy.

Of the 30 patients, 4 only were unmarried, illustrating the frequency of diseased conditions complicating pregnancy in married women; 16 of the 30 were sent to the Hamilton ward by medical practitioners not connected with the hospital.

¹ Journal of Obstetrics and Gynecology of the British Empire, February, 1909.

The average age of the patients was thirty, and 9 were primiparæ. All periods of gestation were represented. The time of each patient's stay in the ward varied from two to one hundred and fourteen days; in 7 only was the minimum time reached; in 14 cases the patient remained from three to nine days; in 4, from ten to twenty days; in 1, thirty days; in 1, thirty-four days; in 1, forty-two days; in 1, fifty-six days; and in 1, one hundred and fourteen days.

The average number of days spent in the hospital after delivery was thirteen. The patient who stayed longest under observation had albuminuria and hematuria before labor; after labor, a diagnosis of renal tumor was made. The results of treatment in these cases were satisfactory; with but one exception the patients did well; 6 of them did not remain in the hospital for labor. None of these, however, did badly after returning to their homes.

The results with the children were not so favorable as with the mothers. In the 30 cases, 10 were stillborn, only one of which had reached the ninth month of pregnancy; 7 of these were macerated as well as still-born; 4 others died soon after birth, and 11 survived; of these 6 were prematurely born.

These results justify Ballantyne's plea that wards in Maternity hospitals be set aside for the treatment of complications in pregnancy. Obviously, it would be scarcely practicable to establish a separate hospital for this purpose. Where pregnancy is interrupted, these cases require the surgical care given in a well-ordered maternity. Furthermore, if these patients remain until labor, it is interesting and valuable to follow the cases to their termination; but it seems to us that Ballantyne has well established his point that such wards should be added to maternity hospitals.

Ovulation during Pregnancy. In Leopold's clinic Ravano¹ examined sixty ovaries taken from pregnant women in the later months of gestation. He concluded from this investigation that in 5 per cent. of all cases ovulation continued during pregnancy. He based his conclusions upon the detection of the corpus luteum.

Seitz² reviews Ravano's work, and from his own studies concludes that ovulation does not proceed during pregnancy in the normal and typical manner. The Graafian follicle does not ripen fully, but develops to a certain degree only. Together with hypertrophy and hyperplasia of the lutein cells, a process of atresia develops, which makes it improbable that normal ovulation develops during pregnancy.

Elimination of Chlorides during Pregnancy, Especially in Cases of Nephritis. Zangemeister³ reviews the literature on the subject, and adds his own investigations made in the clinic at Königsberg.

¹ Archiv f. Gynäkologie, 1908, Band lxxxiii, Heft 3.

² Zentralblatt f. Gynäkologie, 1908, No. 10.

³ Archiv f. Gynäkologie, 1908, Band lxxxiv, Heft iii.

In the writings of those who have investigated the total quantity of urine passed at the end of pregnancy, a considerable increase is observed. The quantity of chlorides excreted is rather less than the average. If the chloride of sodium be subtracted from the total urinary excretion, the remaining chlorides are very considerably lessened. They are retained and their presence seems to be connected with the toxemia so frequently seen in pregnancy.

The blood of the pregnant patient is richer than normal in chlorides, which accounts for the diminished excretion in the urine. Their function seems to be to maintain the isotonic condition of the blood and thus promote the metabolism and interchange of nutritive material between the mother and fetus. In cases of nephritis and threatened eclampsia there seems to be an effort to rid the patient of retained chlorides when they may be found abundantly in the urine. In other cases, the urinary quantity is greatly diminished, as the organism does not seem able to eliminate it. Under normal conditions there is neither excess nor deficiency. In nephritis and eclampsia there is a pronounced retention of chlorides.

Necrosis in a Myomatous Tumor Complicating Pregnancy. Schenk¹ reports the case of a patient who suffered from disturbed menstruation with vaginal hemorrhage, rapid increase in the size of the abdomen, and pain in the lower abdomen with vomiting. Pregnancy of seven or eight months was diagnosticated, but a later examination found evidence of the presence of a myomatous tumor complicating the pregnancy.

On admission to the hospital, the diagnosis of a five months' gestation, complicated by myoma, was made. Under rest in bed and preparatory treatment the patient's general condition improved sufficiently to warrant operation. Supravaginal amputation of the myomatous tumor was performed without especial difficulty. The right tube and ovary were left, and the bloodvessels, which were large, were carefully ligated, so that little blood was lost. The patient made a good recovery.

On examining the specimen, the tumor was found to be as large as the head of a man. The upper portion was composed of a myoma undergoing necrosis. In the lower portion was found the fetus partially compressed by the tumor above. The patient's recovery was uneventful.

Of especial interest in the case was the very rapid growth of the tumor, which was apparently stimulated by pregnancy, and the extensive necrotic changes which were found in the tumor.

Haultain² has also contributed an interesting and valuable paper upon this subject. From the reports of the Edinburgh Royal Infirmary he finds that in 100 cases of fibromyomata, 37 were single women and 63 married. Of the married, 32, or 50 per cent., were childless.

¹ Zentralblatt f. Gynäkologie, 1908, No. 7.

² British Medical Journal, December 5, 1908.

This is greatly in excess of the ordinary rate of sterility among the married, which is quoted as 10 per cent.

Haultain has operated upon 290 cases of uterine fibromyomata before menstruation had ceased. Of these, 179 were married and 82 of them had no children; 97 among them had 222 children. The largest family was 6.

The relative sterility of these patients was striking, the youngest child averaging seven years; the age of the mothers averaged forty-one. Apparently patients who have small fibroids frequently become pregnant, but the fibroid grows during pregnancy and the patient remains sterile subsequently. There is no question but that their presence predisposes to sterility.

Haultain does not believe that fibroids complicate pregnancy frequently. In ten years' experience in the Edinburgh Maternity Hospital, out of over 4000 cases of pregnancy and labor, in but five were fibroids present.

The mere presence of fibromyomata in the wall of the pregnant uterus cannot be considered a serious complication. When, however, they disturb the general health of the patient, or is so situated that they must make labor impossible or difficult, they become of great importance. Their presence complicates pregnancy by pressure, from their position or size; by degeneration going on during pregnancy; by mechanical interference with pregnancy and labor; by hemorrhage during labor or postpartum; and by increased liability to subsequent infection.

Haultain discusses 10 cases upon which he operated. Laparotomy was performed four times during pregnancy, twice during labor, three times after expulsion of the fetus occurred, and once after labor had ceased without expulsion.

During pregnancy, three of the four cases required operation because of pain caused by pressure. Such pain is usually intermittent and may readily simulate the pain of abortion or premature labor.

In three cases infection of the tumor rendered operation imperative. In one fatal case a streptococcus infection had gained access to the fibroid before the fetus was expelled; in the other two, a staphylococcus infection occurred subsequently. The fact that these tumors readily become infected postpartum is a strong argument for their removal at the time of the delivery of the fetus.

The diagnosis of this condition is not usually difficult. The prognosis will depend upon the size and situation of the tumor, and the presence or absence of infection.

So far as treatment is concerned, while myomectomy may be theoretically desirable, it is practically far less safe than hysterectomy. After myomectomy in pregnancy, the site of the tumor may become infected, and premature labor may result with the dissemination of infection throughout the peritoneum.

Enlarged Wandering Spleen Complicating Early Pregnancy; Splenectomy. A. B. Davis¹ reports the case of an Italian woman, aged twenty years, married, and pregnant for the third time. With the exception of severe attacks of malaria, her medical history was uneventful. Three months before admission she had pain in the left upper part of the abdomen, and noticed a swelling the size of a fist. The pain gradually became worse, being severe, sharp, and knife-like, in the region of the spleen and radiating toward the right side. The swelling increased in size, and there had been persistent vomiting for three days.

On examination there was a freely movable indurated tumor in the upper left portion of the abdomen. Under chloroform anesthesia the abdomen was opened and the tumor found to be an enlarged spleen. The uterus was in mid-position, anteverted, with softening of the lower segment, its right side being thin, elastic, and distended by the ovum. The pregnancy was early in the fourth month. Splenectomy was performed, all the splenic vessels being greatly enlarged. The pedicle was short and not twisted. Transfixing ligatures of heavy chromic gut were used with a large clamp, and the vessels were tied and cut separately, without much hemorrhage. The stump at the tail of the pancreas was closed over with peritoneum; there was practically no loss of blood, and the patient made a good recovery.

A blood count was taken a few hours before, and another half an hour after the operation. The pregnancy was uninterrupted, the patient subsequently giving birth to a healthy child in spontaneous quick delivery.

Examination of the tumor showed a great increase in fibrous tissue of the capsule and trabeculæ. There was an extensive proliferation of fibrous tissue throughout the pulp, with a diminished number of cells. There was almost complete atrophy of the cells of the Malpighian bodies.

Symphysiotomy during Pregnancy. Lehmann² quotes two cases of symphysiotomy performed during pregnancy, and adds one of his own.

The patient's pelvis had a conjugate diameter of $9\frac{3}{4}$ to 10 cm. (3.8 to 4 in.); the symphysis $5\frac{1}{2}$ cm. (2.2 in.) high. In her first labor she was delivered by prophylactic version, it finally being necessary to deliver the after-coming head by forceps. The induction of labor was proposed, but the patient did not come to the hospital at the time selected, and when she presented herself the head of the child had grown so large that it could not be made to enter the pelvis, and the induction of labor was declined. The mother earnestly desired that the child should survive in good condition, and accordingly symphysiotomy was chosen. A transverse incision was made and the symphysis exposed, a finger placed beneath it to protect the urethra, the symphysis was opened, and the pelvic bones separated from 2 to 3 cm. (0.8 to 1.2 in.).

¹ Bulletin of the Lying-in Hospital of the City of New York, June, 1908.

² Archiv f. Gynäkologie, 1908, Band lxxxvi, Heft 2.

As the patient was not in labor, a dressing was applied and the wounds closed.

The night following the operation there were signs of threatened labor, followed by the discharge of some of the amniotic liquid. The patient did not expel the fetus, and was discharged from the hospital pregnant and in good condition. She went to her home, and when labor developed, twenty-seven days after the operation, it began by the premature discharge of amniotic liquid, and was finally terminated by the application of forceps.

Examination of the symphysis showed slight tenderness over the joint. The two ends of the symphysis were movable, although this could be detected with difficulty. The true conjugate was unaltered, and additional space was probably obtained in the lateral and oblique diameters.

The reason for performing symphysiotomy in pregnancy seemed to be to anticipate the difficulties of labor by enlarging the pelvis before labor actually began.

Frank and Gauss report similar cases in which the patient left her bed on the tenth day.

The general conclusion of Lehmann's paper is that symphysiotomy in pregnancy does not result in sufficient enlargement of the pelvis to make spontaneous labor possible. In his own case, a rather difficult forceps delivery was necessary to complete the patient's confinement.

The Influence of Pregnancy upon Certain Medical Diseases, and Certain Medical Diseases upon Pregnancy. French¹ delivered before the Royal College of Physicians, in London, the Goulstonian Lectures in 1908, choosing the above as his subject.

In considering these cases, French believes that in the absence of abortion or labor, much of their treatment may depend upon the medical man or some other specialist who may be called in accordance with the symptoms which develop. In cases of acute infection arising during pregnancy, three questions offer themselves at once for solution:

1. Is the pregnancy likely to make the infection more severe than otherwise it would be?
2. Is the pregnancy likely to terminate abnormally because of the infection?
3. Ought the treatment of the patient to be different in any way from that of other persons suffering from a similar infection?

He takes, first, for consideration, *herpes gestationis*, a disease peculiar to pregnancy. This is apparently related to pemphigus, to hydroa, to erythema bullosum, and to dermatitis herpetiformis. The eruption is variable in size and location, the vesicles being preceded by an itching erythema.

The following is a descriptive case, treated at Guy's Hospital, in which the patient had suffered during several pregnancies from this disorder:

¹ British Medical Journal for May 2, 9, and 16, 1908.

The present attack began at three months after pregnancy, and was made somewhat better by the yellow oxide of mercury ointment locally and by Fowler's solution internally, rest in bed, light diet, and laxatives. The trouble, however, persisted until the birth of the child living at term, and then, as on eight former occasions, the disorder rapidly disappeared.

The pigmentation and the *eosinophilia* are also described. In the commoner varieties of skin disorders there is no eosinophilia. In herpes gestationis there were 14 per cent. of coarsely granular eosinophiles, the significance of which was obscure. While the pathology of the condition may not be clear, the pregnancy itself is not interfered with by the skin disease, provided suitable treatment be adopted to prevent pyoderma and the patient obtains sufficient sleep. The children are born living and healthy, and do not seem to be especially liable to the same disorder. The necessity for collective investigations of this disease is evident. A virulent type of herpes gestationis is occasionally seen, with fever, vomiting, and delirium, which is usually fatal in a few months. An internal toxemia seems to be the cause of death. Eczema is not necessarily made worse by pregnancy, but psoriasis is either greatly improved by pregnancy or made very much worse.

French next described two cases of *pyelonephritis* occurring in gestation. In one the right kidney showed abnormality upon percussion and palpation. The urine gave a pure culture of *Bacillus coli communis*. The patient improved under rest in bed, and the use of urotropine. The child was born alive at full term, and both made good recoveries.

In the second case there was considerable fever, with pain in the right abdominal region extending to the kidney. The patient's leukocytes were 25,000 per c.mm. of blood, so that the leukocyte count was of no help in distinguishing the condition from abscess of the appendix. A pure culture of *Bacillus coli communis* was obtained from the urine. As the patient grew steadily worse, the right kidney was exposed by incision and found studded all over with small abscesses. As there was no large collection of pus which could be drained, and the patient's condition was critical, a gauze drain was inserted and the wound partly closed. The ureter was dilated above the bladder. The patient improved immediately after the operation, and two weeks later, urine in abundance was discharged through the lumbar wound. The patient was also treated by vaccine prepared from cultures of the *Bacillus coli communis* obtained from the patient's urine. Injections were made at intervals of about two weeks, the dose consisting of the products of 500,000,000 bacilli. The patient steadily improved, but the pyuria persisted.

After the temperature had been normal several days, the patient expelled a living, premature child, born on the seventy-seventh day of her illness. Mother and child made good recoveries, the lumbar wound gradually healing.

French calls attention to the fact that the gravid uterus has much to do with this condition. It is not secondary to cystitis, for the bladder is usually healthy. The ureter is dilated about an inch above the bladder. It seems almost certain that the enlarged uterus compresses the ureter against the pelvic brim, causing retention of urine in the ureter, with the development of infection spreading to the kidney. Most of the cases are upon the right side, probably because the uterus develops more to the right than to the left. The presence of the *Bacillus coli communis* in the urine may be explained by the proximity of the bowel and the fact that this germ is often found in the blood. So far as the pregnancy is concerned, the prognosis is usually favorable.

During pregnancy the kidneys may be the site of disease, caused by stone and by tuberculosis. At Guy's Hospital there has been no case of pregnancy with tuberculous kidney in the last twenty years. If a *renal calculus* is small and confined to the pelvis, the pregnancy may run its course without disturbance. If, however, calculi are large or many collect, hematuria may develop. Should a patient with renal calculus already causing suppuration in the kidney become pregnant, her kidney condition is likely to become greatly worse after the fifth month; 7 cases of renal calculus complicating pregnancy are alluded to, one of which proved fatal. The patient had had pain in the region of the right kidney before marriage. When five and a half months pregnant the urine contained casts, blood, and leukocytes. Cystitis developed without fever, and the patient had a premature labor. After a few days she died in coma. Double pyonephrosis was found at autopsy.

French divides the non-suppurative diseases of the kidney in pregnancy into three clinical groups: (1) Those in which *Bright's disease* existed before pregnancy; (2) those in which the urine was healthy before pregnancy, but in which acute Bright's disease developed during the pregnant condition, these he calls edema cases; (3) cases in which the patient was apparently healthy until the latter months of pregnancy, when eclampsia developed either just before or just after labor. He considers it not improbable that the granular contracted kidney has some relationship to pregnancy. He believes that obstruction of the ureters by the pregnant uterus, or some pathological condition of the pelvic organs may lead to fibrosis of the kidney.

While the danger of conception in those having Bright's disease is recognized, it is also admitted that many such patients survive repeated pregnancies. He mentions a case in which a patient had chronic tubular nephritis thirteen years; was married eight years; and had six living children.

In discussing the edema cases and those of eclampsia, he places them together as both attributable to pregnancy, and believes that the point admits of no discussion.

At autopsy the kidneys in these cases do not present the lesions

characteristic of Bright's disease, nor is there any agreement as to the lesions actually present. At Guy's Hospital in recent years, there have been 4 fatal cases of the edema type, and 15 fatal cases of the eclamptic type of renal trouble in pregnancy, out of a total of 71 cases of the former and 51 cases of the latter.

French believes that the kidney changes in pregnancy are essentially similar to those which may occur in scarlet fever in both these classes. He believes that the pathology of uremia is still unknown, but is of the opinion that the condition of the liver may have something to do with the kidney condition. The prognosis is better in pregnancy nephritis without eclampsia. This condition is most often seen in primiparæ, and albuminuric retinitis is not uncommon. Twin cases are more severe, and the fetus often dies in utero, or does not long survive its birth. The mortality of pregnancy nephritis was 5 per cent.; of eclampsia, 29 per cent.; which French considers much less than that of an acute uremia in the non-pregnant.

He also recognizes the fact that albuminuric retinitis in these cases entirely disappears after the pregnancy is over. It often indicates a high mortality; in his cases, 15 per cent. in non-eclamptic patients and 66 per cent. in those who had eclampsia.

The high mortality in twin pregnancy points to toxins formed in the placenta as the essential cause of the condition. The mortality among the children is also due to toxemia.

So far as treatment is concerned, rest in bed and the treatment of the acute toxemia are indicated. Premature emptying of the uterus may be tried, although it does not invariably improve the condition. A patient with but one sound kidney, the other having been removed, may pass through pregnancy safely.

French finds that the combination of *tetany* and *pregnancy* is apparently rare in London. No case has been reported at Guy's Hospital during the last thirty years. Tetany is most common in the first four months of the year, tends to become epidemic, and seems to be of local distribution; it is most often seen in Heidelberg and Vienna, where it is apparently endemic. Its pathology consists in changes in the cells of the spinal cord which are not permanently developed during the latter half of pregnancy. Spasms rarely occur during labor, but may first be seen during lactation. The child seems but little affected, and patients recover under the treatment usually given in tetany.

In discussing the diseases which may occur in the pregnant woman, for which the pregnancy is not responsible, French first considers *appendicitis*. He recognizes the difficulty of diagnosis, as the vomiting of pregnancy may mask that caused by appendicitis, and disease of the right tube or ovary may obscure inflammation of the appendix. Pregnancy does not, in his observation, predispose to appendicitis. During the last twenty-seven years at Guy's Hospital but one such case has been

seen. Premature labor developed, after which disease in the appendix speedily subsided.

It cannot be proved that pregnancy tends to rekindle appendicitis in a patient who previously had it, nor is it proved that the co-existence of pregnancy makes appendicitis more than usually severe. It is true that the further advanced the pregnancy may be, the greater is the tendency to suppuration in the appendix. Salpingitis and endometritis may develop after the abscess of the appendix has been drained. If pus forms, the uterus empties itself prematurely. The uterus in most cases forms one wall in the abscess cavity when pus is present.

As regards treatment, operation should be performed promptly to lessen the liability to abscess, and if possible to avoid the premature emptying of the womb. Under no circumstances should abortion or premature labor be induced. In a pregnant woman developing symptoms of severe appendicitis, immediate operation is clearly indicated.

French discusses the relation of pregnancy to the essential fevers, and especially to *typhoid fever*. The course of the disease in pregnancy seems to be the same as in the non-pregnant. In his cases the death rate was 14 per cent.; in Vinnay's, 17 per cent.; in Duinot's, 16 per cent.; essentially the figures given in the non-pregnant. Pregnancy, however, was interrupted in 85 per cent. of his cases, 66 per cent. of Vinnay's, 63 per cent. of Martinet's, and 65 per cent. of Penot's.

It is, however, quite possible for a woman to pass through a typical attack of typhoid fever, recover, and give birth to a healthy living child.

There is no period of the fever at which premature labor is most likely to occur, and the mother suffers remarkably little from labor. She is sometimes much better after the uterus is emptied, and involution often proceeds normally.

French believes that transmission occurs from mother to child through the placenta, and also through the liquor amnii. Nourishment is conveyed by the transmission of chemical substances from the maternal to the fetal circulation. There is also transmission from fetus to mother. The placenta has a selective power in health, which is sometimes called its barrier action. This is greatly reduced by the mother's illness. Bacteria may pass from mother to fetus through the placenta, but many germs are retained in the placenta.

Microscopic lesions of typhoid fever have been found in the fetus of a patient suffering from this infection. So far as interfering with the pregnancy is concerned, the fetus seems to be infected by the typhoid bacillus at about the fourth and subsequent weeks. If the child then is viable, and the parents agree, premature labor may be induced before the fourth week of typhoid, in the hope that the child will have escaped the infection. If the child's interests are not to be consulted, pregnancy should remain undisturbed.

Smallpox may attack the fetus from the third month onward and the characteristic eruption be found at birth. Sometimes the characteristic lesions are found upon the mucous surfaces only. If the mothers be vaccinated during pregnancy, two-thirds of the children can be successfully vaccinated later; but one-third resist vaccination for some time after birth.

Measles, cerebrospinal meningitis, and anthrax may all attack the pregnant patient and be conveyed to the fetus.

Pregnancy offers no immunity to the woman against measles, whooping cough, scarlet fever, chickenpox, mumps, diphtheria, and smallpox. These infections are all more severe in pregnancy than in the non-pregnant.

The maternal mortality in *scarlet fever* is stated at 75 per cent.; in *diphtheria* without antitoxin, at 50 per cent.; in *smallpox*, at 15 per cent.

As regards *cholera*, Schütz studied this disease at Hamburg in 2500 women. The uterus was often infected, and hemorrhage occurred in one-third of the non-pregnant cases. In Hamburg, and in Russia, in epidemics of cholera, over 80 per cent. of the pregnancies were terminated during the attack of cholera. An effort should be made in treating these patients to prolong the pregnancy, and never to interrupt it. The same observations apply to the plague.

As regards *malaria* during pregnancy, in mild cases the pregnancy goes on successfully. Where the maternal temperature reaches 104° during the attack, pregnancy is very apt to be interrupted. In the bilious remittent type, mother and child frequently die. During the paroxysms fetal movements and uterine contractions often become excessive. Quinine prevents premature labor in malarial patients, diminishes uterine contractions, and lessens fever. The child is often born with a greatly enlarged spleen.

Influenza may become an important complication of pregnancy. In the bronchitic or pneumonic type it may prove fatal to mother and child. Pregnancy should not be interrupted, and the infection should be avoided during pregnancy, if possible. During an epidemic in Paris, Bar and Boullé observed 40 cases, of whom 37 had the respiratory form of influenza; 4 of these developed pneumonia, of whom 2 died and 2 recovered slowly after delivery.

Lobar pneumonia during pregnancy is not especially grave in the early months. Abortion occurs in about one-third of the cases. In the second half of pregnancy, gestation terminates in two-thirds of the cases, the maternal mortality being nearly 50 per cent. The more advanced the pregnancy, the graver the prognosis. Pregnancy should not be interrupted artificially during pneumonia.

Addison's disease during pregnancy is comparatively rare, but 2 cases being observed at Guy's Hospital during the last twenty years, both of which terminated fatally. The diagnosis is not always easy, as pregnancy

causes pigmentation of the skin, which may obscure the characteristic bronzing of Addison's disease. The suprarenal capsules in the cases cited were found typically caseous at autopsy. There was no other lesion.

In *leukemia* complicating pregnancy, the acute form proceeds rapidly to a fatal termination. The child is usually lost with the mother. In splenic leukemia, the disease may persist for several years, and pregnancy occur during the disorder. Premature delivery is common, and patients often die soon after the termination of pregnancy. In *diabetes* the lactosuria and glucosuria of pregnancy do not seem to be associated with the disease itself. When pregnancy occurs in diabetic patients, death may result from acetonemia, and the amniotic liquid is often excessive. The fetus is often dropsical and frequently dies before birth. Diabetes does not prevent pregnancy, and is often uninfluenced by it; and pregnancy should not be interrupted in these cases.

Diabetes insipidus may develop in pregnant women following shock or severe fright. The fetus is often insufficiently developed or badly nourished in these cases, but the mother usually recovers.

A few cases of *myxedema* accompanied by pregnancy are recorded. Apparently the thyroid condition predisposes to sterility. In the child it is possible that thyroid deficiency might be present.

In 29 cases of *chorea* coming under French's observation, complicated by pregnancy, 26 patients recovered and 3 died. In the cases that recovered there was little fever, although the movements were violent. In the cases that died the fever was severe.

In addition to French's observations, attention may be drawn to the fact that altered conditions of the *thyroid gland* are often present in abnormal pregnancy. In some cases of the toxemia of pregnancy, the administration of thyroid extract is followed by marked improvement. In cases of pseudocyesis French has observed the thyroid gland markedly altered.

Pregnancy in Basedow's Disease. Before the Obstetrical Society of Leipzig, Lichtenstein¹ reported a severe case of Basedow's disease in a pregnant woman. She was aged thirty-nine years; a sister died of heart failure during pregnancy; another sister suffered from Basedow's disease.

The patient had had three pregnancies, in the second and third of which there was no marked enlargement of the thyroid. During the pregnancy under consideration the symptoms of Basedow's disease rapidly developed, with asthma and pronounced tachycardia.

On admission to the hospital, the patient was in a wretched condition; the pulse was 140, the circumference of the neck 42 cm., and the patient was edematous, with 2 per cent. of albumin in the urine. The uterus

¹ Zentralblatt f. Gynäkologie, 1908, No. 28.

gradually dilated, and without much difficulty a dead child was extracted by the breech. This was followed by a second, both fetuses being about six months advanced. The patient died in about one day after her delivery.

It is thought that in most cases pregnancy is a serious complication of Basedow's disease. Premature separation of the placenta and fetal death are common complications.

Diabetes Mellitus in Pregnancy. Offergeld¹ has collected forty-eight cases of diabetes complicating pregnancy. He has studied two cases very thoroughly to determine the changes in metabolism occurring in these patients.

In the second patient labor was terminated by artificial dilatation and delivery, the mother being in beginning coma at the time of operation. The child was stillborn.

At autopsy the spleen was not enlarged; the liver normal in shape; the superficial surfaces brown in color, and with anemic patches reaching into the parenchyma. Acinosis was evidently present on section of the liver. The pancreas showed trabeculæ of connective tissue.

In the stomach and duodenum there were erosions of the mucous membrane, with hemorrhage. The suprarenal capsules and the kidneys were normal. The lymphatic glands of the mesentery were tuberculous and showed cheesy degeneration.

The fluids of the mother's body were examined as thoroughly as possible. The urine gave a marked reaction to acetonic, diacetic, and oxybutyric acids. Dextrose and levulose were also present. In the blood of the mother, acetone gave a positive reaction, the iliopsoas muscle contained glycogen and dextrose, as did the liver; and in the distillate of the liver the fatty acids were found in abundance. The liver of the child was especially rich in glycogen, and also contained dextrose; and small percentages of these were found in the muscles of the thigh. The placenta contained no fatty acids, gave a reaction for acetone, but was negative for diacetic and oxybutyric acids. The placenta also contained a large percentage of dextrose. In the amniotic liquid no acetone nor fatty acids were found. The diazo reaction was also negative. The umbilical cord contained no carbohydrates; the blood in the umbilical arteries and in the umbilical vein contained a trace of dextrose.

It is estimated that diabetes interrupts pregnancy in 33 per cent. of the cases. Polyhydramnios is often present. Diabetic coma varied in 17 out of 58 collective cases.

The maternal mortality is estimated at 50 per cent., while the fetal mortality is 66 $\frac{2}{3}$ per cent.

The conditions to be feared as almost invariably fatal are the development of acidosis and coma.

¹ Archiv f. Gynäkologie, 1908, Band lxxxvi, Heft 1.

Experimental and Clinical Studies in the Tetany of Pregnancy. Adler and Thaler¹ report two cases of tetany complicating pregnancy in which the electrical reaction of the muscles was taken, and in which both patients recovered. To ascertain the cause of this condition, the writers experimented upon animals, both in the pregnant and non-pregnant condition, to determine the influence of injury to the parathyroids in the production of tetany. Their experiments seem to show that the destruction of these bodies is followed by falling of the hair and teeth, the development of cataract, and a tendency to the development of tetany as well.

Pyelitis of Pregnancy. Stoeckel² urges the importance of ureteral catheterization in these cases with irrigation of the pelvis of the kidney. He reports five recoveries in patients so treated. The children were born living; the mothers and children made uninterrupted recoveries.

Hematuria in Pregnancy. Balloch³ reports the case of a patient who had lived in a malarious region, who had borne seven children.

The year before coming under observation she had expectorated blood without known cause. She had had hematuria during pregnancy for several years preceding, but gave no history of renal colic, and was not suffering from malaria. The hematuria had never entirely disappeared, and was worse when pregnant.

On examination, the patient was anemic, blanched, and had soreness on palpation over the left kidney, but no enlargement. The urine contained abundant red blood cells; no pus; no casts.

On cystoscopy, the bladder was found to be normal; from the left ureter bloody urine emerged; fluid from the right kidney was normal.

As the patient had had medical treatment without avail the left kidney was removed. The kidney was small, and pale, and the capsule non-adherent, with two patches of subcapsular hemorrhage. There were dense adhesions about the upper pole. During her next pregnancy she had blood in the urine. This disappeared after the birth of the child, and she has since remained well.

Microscopic examination of the removed kidney showed degeneration of the epithelia of the convoluted tubules, increase in the connective tissue, and oozing hemorrhage into the kidney.

It is interesting to note the slight effect upon the subsequent pregnancy produced by the removal of the kidney.

Bauman⁴ reported 17 cases of hematuria in pregnancy. The blood was from the kidney and disappeared after delivery in several cases, reappearing during the subsequent pregnancy.

These cases have been treated by decapsulation, nephrotomy, and

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1908, Band lxxii, Heft 2.

² Monatsschrift f. Geburtshülfe und Gynäkologie, 1908, Band xxviii, Heft 5.

³ Surgery, Gynecology, and Obstetrics, March, 1908.

⁴ Monatsschrift f. Geburtshülfe und Gynäkologie, June, 1902.

nephrectomy. The surgical means have not been thoroughly efficient. A single case is reported in which adrenal solution was injected into the pelvis of the kidney through a ureteral catheter, followed by improvement.

I have recently observed an interesting case of hematuria during pregnancy, seen by me in consultation with my colleague, Professor Horwitz, at the Jefferson Hospital. The patient was an anemic Jewess who had borne children, and in whose blood was found no explanation for the hematuria. On cystoscopy, Professor Horwitz had observed blood oozing from one ureter, and then from both. The double character of the lesion seemed to forbid operation. Medical means failed to influence the condition.

The patient was transferred to the Maternity Department of the Jefferson Hospital, where I induced labor. A dead fetus was readily expelled after the introduction of bougies. There were no gross lesions in the placenta to account for the condition, but the placental substance showed the changes characteristic in advanced toxemia. The hemorrhage gradually ceased from the mother's kidneys, and she ultimately regained a fair degree of strength.

The most rational explanation of this case was a toxemia, probably of fetal origin. The patient had no increased pulse tension or symptoms of hepatic toxemia. There was a chronic intestinal toxemia of considerable severity.

Pregnancy Complicated by Heart Disease. Cameron¹ contributes a paper upon this subject, giving the results in 13 cases in a total of 1022 confinements.

There was a definite history of heart disease previous to pregnancy in 6; the youngest patient was aged twenty-one years; the oldest, forty; 8 of the patients came to labor at full term; 2 shortly before; 2 had premature labor; and 1 was not delivered. There were but 4 spontaneous labors in the series.

Chloroform alone was used in 3 cases; ether alone in 1; morphine in 2; morphine and chloroform in 1; morphine, chloroform, and ether in 1; while in 4 cases there was no anesthesia or narcosis. The mortality among the mothers was 2.

In discussing the management of these cases, and their prognosis, Cameron has found that it is impossible to classify heart lesions in pregnancy in an arbitrary manner. In mitral stenosis, the second stage of labor should be shortened as much as possible, preventing bearing-down pains by narcosis or anesthetics, and delivering artificially as soon as it can be done. Bleeding may be employed to advantage. Perfect rest should be secured and strychnine and digitalis given if necessary. Much the same treatment is indicated in mitral insufficiency.

¹ American Journal of Obstetrics, September, 1908.

During pregnancy the patient should be put in the best possible general condition, constipation should be avoided, anemia corrected, and digitalis used in moderate doses if compensation fails.

Harrar¹ gives his results in 97 cases of heart lesion complicating pregnancy in which compensation failed to some extent.

In 3000 pregnant patients, endocardial murmurs were found in 5.3 per cent. Most of these cases presented no symptoms.

Of the 97 patients treated, 15 were discharged undelivered; in the remaining 82, 6 died undelivered, and the total mortality of the 82 cases was 30 per cent.

The prognosis improves as the patient goes on in pregnancy without failing compensation. Where compensation has failed in a previous pregnancy the prognosis is very bad.

Whether the cardiac lesion is primary or secondary to kidney disease is a matter of importance in making the prognosis. If the kidneys are seriously damaged the outlook is unfavorable. If compensation once fails, it seems to make little difference what variety of cardiac lesion is present. Double mitral lesion showed most frequent failure of compensation and also greater ability to recover. Simple aortic lesions are most infrequent and have the best recuperative power. Combined mitral and aortic disease is the most serious of all in failing compensation.

The fetal mortality was 33 per cent. The nourishment and weight of the child born living was fully as good as that of children born from healthy mothers; 29 of the children were premature.

Prophylaxis is of the greatest importance, and consists of strict hygiene during pregnancy. Of these patients, 69 recovered from the first breaking down of compensation. Rest is the one great and important thing when compensation fails.

As regards drugs, tincture of digitalis or the powdered leaves, in pill form, are the most efficient. During labor the digitalis should be given hypodermically if needed. Bleeding from the arm—six or eight ounces—with the giving of digitalis, is indicated. Tincture of strophanthus is more prompt in action than digitalis, but its results are less permanent. In edema of the lungs with dyspnea, strophanthin should be given hypodermically. Digitalis, strophanthus, and nux vomica, given together, is an exceedingly efficient cardiac tonic. Caffeine may be used with digitalis to stimulate the action of the kidney. Calomel and magnesium sulphate are especially useful in promoting absorption of dropsical effusions. Morphine and codeine are valuable for dyspnea and insomnia. An ice-bag to the precordia assists in the action of these remedies.

In cases where suppression of urine threatens, salt solution may be given by the bowel, by irrigation, or continuous instillation. Oxygen

¹ Bulletin of Lying-in Hospital of the City of New York, September, 1908.

should be combined with chloroform as an anesthetic for these cases. Dry cupping over the sides and back of the chest gives great relief in the dyspnea of pulmonary edema.

The induction of labor for chronic endocarditis is entirely unjustifiable. When compensation fails the induction of labor is justifiable, after rest in bed, with medical treatment, have not produced improvement.

In inducing labor the patient should be placed at the edge of the bed or table, propped up in a sitting posture with pillows, the legs supported by assistants. Anesthesia is often necessary if the cervix will not admit one or two fingers. Chloroform and oxygen is the safest anesthetic. With aseptic precautions, the cervix is dilated sufficiently to admit two fingers, and an elastic bag inserted and dilated. If the cervix is sufficiently dilated, an anesthetic is often unnecessary. Labor is excited by traction upon the bag, and delivery is completed by forceps, version, or craniotomy. When the patient is moribund, multiple incisions in the cervix are indicated.

During the second stage the sitting posture of the patient should be still maintained, the cervix dilated to completion, and forceps applied. The heart should be sustained by hypodermic injections of strychnine and digitalis.

In the third stage of labor, if the right heart is dilated, moderate postpartum hemorrhage should be encouraged. When the countenance is pallid, and the pulse small and weak, a pad should be placed over the epigastrium and a tight binder applied to maintain intra-abdominal pressure. If the patient is anemic, all bleeding should be prevented.

After delivery the patient must be closely watched, as she may go into collapse at any time during the forty-eight hours.

The baby should have a wet-nurse, but if the mother's kidneys are sound when she has recovered from labor, she may partially nurse the child. If the balance of compensation can be preserved during pregnancy, heart cases often pass through labor and do surprisingly well.

The Influence on Pregnancy upon Pulmonary Tuberculosis. Hermann and Hartl¹ give the results of their studies upon animals on the effect of pregnancy upon pulmonary tuberculosis.

These experiments consisted in causing rabbits, which are very sensitive to tuberculosis, to inhale material from cultures of the tubercle bacillus. They also divided the animals into two groups, using one-half of them for control experiments. In 71.5 per cent., tuberculosis in the respiratory organs of animals was greatly influenced by pregnancy; in 28.8 per cent. no such influence was observed. In cases which did badly, there was a rapid increase in the size of the tuberculous nodules, caseation of tissue occurred, bronchiectasis developed, or, if already present, increased greatly in severity. Especially important was the rapid appearance of caseation.

¹ Zentralblatt f. Gynäkologie, 1908, No. 30.

Lobenstine¹ reports 100 cases in which tuberculosis existed as a complicating factor of pregnancy; 34 per cent. of these were mild cases; 66 per cent. were pronounced. The tuberculosis was slightly aggravated in all of these. They were all discharged from the hospital on the tenth day, or soon after, of the puerperal period.

In 16 per cent. the cases, where chronic, were so-called fibroid phthisis. These seem practically unaffected by pregnancy or labor. In 12 per cent. the cases were severe, and these patients showed a marked decline during the last three months of pregnancy. In 38 per cent. the disease was far advanced when the patients came under observation.

Tubercle bacilli were found in the sputum of all the severe cases: in 8 per cent. of the pronounced ones, and in 19 out of 34 mild cases, that is, in 56 per cent.

In all cases which are at all severe the greatest danger to the patient begins in the latter part of pregnancy. The disease increases rapidly throughout the puerperal period. A temporary improvement is observed in mild cases in the middle three months of pregnancy; 19 patients died out of 100, making 19 per cent., and if the very severe cases are reckoned, the number of deaths was 50 per cent. Stillbirths occurred in 7 per cent., and the infant mortality was 13 per cent.

As far as the prognosis is concerned, there is no question, in Lobenstein's opinion, but that the coincidence of pregnancy and tuberculous infection is disastrous. It cannot be foretold when the patient will fail and possibly the case proceed rapidly to a fatal issue.

When tuberculosis attacks the larynx the disease is often apparent early in pregnancy, progressing rapidly. Lactation should not be permitted in tuberculous patients, as it greatly increases their exhaustion and hastens death.

So far as medical treatment is concerned, the patient should receive the care given to all tuberculous individuals. They cannot often be sent to remote localities because they require constant medical supervision.

During the first three or four months the pregnancy should be interrupted in the majority of cases. After the first three or four months, if the patient is holding her own well, pregnancy may be allowed to continue. If, however, the patient is failing, gestation should be interrupted; but if the case is a bad one, the interruption of pregnancy will be of no especial advantage. Labor should be made as easy as possible. If anesthesia is employed, oxygen should be used with the anesthetic.

Pregnancy is often interrupted spontaneously in these cases. There were 7 per cent. of stillbirths and abortions in the 100 cases quoted; 13 per cent. of the children died while still in the hospital. If the child survives the first week, it may develop a tendency to the disease con-

¹ Bulletin of the Lying-in Hospital of the City of New York, September, 1908.

tracted from the father or mother, or develop disease from direct intra-uterine transmission. In congenital tuberculosis the mother is the transmitting agent, the infection proceeding through the placenta from the maternal blood. The placenta shows tuberculous changes, but the degree of infection in the child does not necessarily depend upon the extent of these changes. After birth such infants should be kept absolutely away from the mother, or any other source of contagion. They should be fed by a wet-nurse, or on modified milk, as the mother should not nurse.

Pregnancy Complicated by Chorea. Shaw¹ has contributed a paper in which he adds three cases to those published in his paper of April, 1907, and printed in the same journal. In the previous paper he reported the treatment of this condition upon lines addressed to the condition of toxemia.

The three cases added in this paper were primiparæ from eighteen to twenty-three years of age. One of these was unmarried and had worried considerably over her condition; two of them were pale and delicate in appearance, with such incessant movements on admission to the hospital that it was difficult for them to take food; the third patient was more robust, but gave a history of chorea at thirteen years of age. She had not slept for three nights before admission, and the movements were so violent that one nurse could not keep her in bed, and when left for a few moments with only one nurse she fell upon the floor. She became excessively violent and had delusions. So soon as elimination was thoroughly secured she fell into a natural sleep lasting sixteen hours, after which she rapidly improved.

She gave birth to a healthy child and apparently made a good recovery. Accompanying her improvement there was an increase in the quantity of urine passed, from 20 to 66 ounces in twenty-four hours, accompanied by a great increase in the quantity of urea and uric acid contained.

These patients were treated by rest in bed, the administration of calomel, the salines, and thyroid extract, five grains every four hours. The normal salt solution was given by the bowel. The diet was confined at first to milk and barley water, until the patient's excretions had become established, when she became hungry. A diuretic mixture was given in some cases. No sedative or narcotic was administered.

Shaw believes that pregnancy should not be interrupted in these cases, and that they will yield to vigorous treatment addressed to the eliminative organs.

The Ocular Complications of Pregnancy. Woods² believes that the bulk of evidence points to the fact that many of the eye conditions in pregnancy are the result of toxemia, and not of uremia or nephritis as a primary lesion.

¹ Journal of Obstetrics and Gynecology of the British Empire, June, 1908.

² Journal of the American Medical Association, July 18, 1908.

He reports three cases of loss of central vision in some portion of the visual field without retinal lesion. The first case occurred in a primipara whose pregnancy terminated abruptly toward the end of the ninth month, after a single convulsion, by forceps delivery. After four days' convalescence with transient visual disturbance, she had pronounced headache and suddenly lost the left field of vision. This loss has been permanent.

The significant element in the examination of this patient's urine before and after delivery was the diminished output of urea during the pregnant state.

In the second case reported, the patient was in her fourth pregnancy, the quantity of urine decreased greatly without albumin, and the amount of urea excreted was greatly lessened. Under a milk diet the quantity of urine increased and so did the urea. The patient had an easy spontaneous delivery, with a normal child.

The third day after delivery she had flashes of light in the right eye, followed by intense pain in the right side of the head. Complete hemianesthesia developed with considerable diminution of muscular force on that side. On the nineteenth day after labor the urine showed albumin with a few casts. The hemoglobin was 50 per cent.; the leukocytes, 11,500; and the red blood cells, 4,240,000.

With the administration of iron she recovered but had some disturbance of sensation and muscular force upon the left side. This was believed to be the result of thrombosis of the posterior cerebral artery.

The third patient had had five miscarriages and a full term dead child. After her confinement she had central visual defect on the right side, from which she ultimately recovered.

Woods believes that in these cases nephritis can be excluded. The toxemia of pregnancy with its tendency to produce edema, thrombosis, exudation and necrosis, with frequent involvement of the nervous system, explains these cases most rationally. In the visual fields, the entire half is obliterated in some; in others where a part of the affected retinal half has spread the tendency is toward permanent involvement of the lower quadrant. The fields indicating total obliteration of the retinal half are thought to result from necrosis, while those showing preservation of a quadrant more probably result from toxic neuritis involving certain fibers only.

Woods also speaks of a hemorrhagic exudative retinitis not resembling the albuminuric form, of which he has seen two cases. The first of these cases had five healthy children, and was in the early months of her sixth pregnancy. She had noticed disturbance of sight, and a diagnosis of neuroretinitis had been made. On examination there was extensive retinitis with hemorrhages and exudates over the entire fundus. The veins were tortuous, thrombosed, broken in places, and venous thrombosis was the evident cause of the condition. Syphilis was excluded.

The patient was found to be excreting very badly, with a high ammonia co-efficient. There was very little nausea and no vomiting. The uterus was emptied, and after this the patient's excretions steadily improved, the output of urea rising from 4.7 grams to 13.75 grams. The ammonia co-efficient fell very decidedly. The patient's eye condition improved correspondingly.

The second case was one of toxemia, in which the ammonia co-efficient rose to 36 per cent., and finally to 40 per cent. The uterus was emptied, the patient remaining intensely septic for several days. There was hemorrhagic neuroretinitis in both eyes, with exudate; there was also multiple neuritis. This patient made a gradual recovery in both the general and ocular condition.

Woods believes that there are four serious ocular manifestations not uncommonly seen after pregnancy and parturition. The most common are the blindness usually seen in connection with eclampsia and what has been termed the albuminuric retinitis of pregnancy. The rarer forms are loss of central or peripheral vision, probably due to retrobulbar neuritis, and also neuroretinitis with exudates and hemorrhages. Woods believes that, in view of recent obstetric knowledge, the term "uremic" should not be applied to the blindness of eclampsia, as it is doubtful whether the renal origin of albuminuric retinitis in pregnancy can be definitely proved.

Cerebral Hemorrhage during Pregnancy has been reported by Jardine.¹ The patient was in the eighth month of her third pregnancy, the two previous pregnancies having terminated in premature labor at the seventh month, with the birth of a dead child. The patient during pregnancy had been exceedingly nervous and apprehensive.

While talking to her husband, in apparently good health, she suddenly lost the power of her right hand. Her face twitched, was drawn to one side, and she became unconscious. On admission to the hospital, the pupils were equal and closely contracted, and reacted to light. The right arm was in spastic contraction; the heart sounds normal, except for accentuation of the second aortic sound; the urine was albuminous; and the patient very restless. The fetal heart beat could be heard.

Three days later, labor developed very gradually, during which the patient had a further hemorrhage. The fetal heart ceased to beat, and the patient gradually sank and died.

The Teeth during Pregnancy. Power² draws attention to the importance of maintaining the mouth in the pregnant patient in as clean and aseptic a condition as possible. He believes that the condition of the patient will regulate the kind of material to be used in filling the teeth, and the sort of operation to be performed. He considers carefully the physical state of the patient, whether she is irritable or not, and

¹ Journal of Obstetrics and Gynecology of the British Empire, January, 1908.

² Journal of the American Medical Association, February 15, 1908.

how many months she has been pregnant. He gives appointments to such patients at noon, as he finds their condition best at that time. His appointments are never longer than an hour, and usually less.

With local anesthesia he extracts all broken-down roots, although they may previously have given no trouble. He then cleans the mouth thoroughly, arranges for the patient to make a monthly visit to the dentist, or to allow him to see her once each month at her home.

He believes that the vomiting of pregnancy has a direct influence in producing dental disease, as in his experience, the degree of nausea and the degree of dental caries are very closely related. He believes that during vomiting the contents of the stomach are thrown into the mouth, with the result that the teeth are saturated with a strong solution of hydrochloric acid. The effect of this, with the decomposition of retained food, is especially productive of dental caries.

After removing the broken-down roots, the teeth are thoroughly cleansed and the patient instructed to use floss silk containing nitrate of silver. The acid condition present is treated by a powder with bicarbonate of soda applied directly after each meal and just before retiring. After vomiting the patient is asked to rinse the mouth with a solution of bicarbonate of soda, to cleanse the teeth with silk, and use the tooth-powder thoroughly. The mouth should be rinsed with a solution of bicarbonate of soda or milk of magnesia every four hours.

After the extraction of a diseased tooth, the cavity is washed with warm water, and cotton saturated with camphor, phenol, and orthoform is placed in the socket of the extracted tooth. He has not seen pregnancy interrupted by such treatment.

It is often difficult to diagnosticate directly the source of pain referred to the teeth during pregnancy. In some cases disease of the pelvic organs is present, and the pain in the teeth does not subside until this has received attention.

The Larynx in Pregnancy. Hofbauer¹ has made a clinical study of the larynx during pregnancy. He believes that there is a relation existing between the upper air passages and the organs of generation, and cites the well-known fact that during pregnancy there are often essential changes in the voice of the patient. He had the opportunity of examining the larynx in patients dying from embolism, eclampsia, sepsis, and hemorrhage after labor; in all he obtained six specimens. The histological changes were practically the same in each case. They consisted of pronounced filling of the smaller and greater vessels in the connective tissue beneath the mucous membrane, constituting practically an active hyperemia. In very few cases was there the passage of red blood corpuscles from the capillaries, nor did hemorrhage occur. When this was present it was probably owing to a disease such as eclampsia, from which the patients perished.

¹ *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1908, Band xxviii, Heft 1.

The erythrocytes found free in the mucous membrane probably resulted from the hyperemia of pregnancy. There was also in the connective tissue beneath the mucous membrane blood pigment, and this has also been seen in the mucous membrane of the larynx in a pregnant animal.

When a microscopic examination was made, cell infiltration was found in the connective tissue beneath the mucous membrane. Beneath the epithelia was a zone of greater or lesser width, whose nuclei took coloring material but partially. The process of infiltration extended also between the muscular bundles in the vocal cords, and was also seen in the glands of the mucous membrane.

Some of these cells were in the form of small lymphocytes with central nuclei. These varied in form, being eosinophile, vacuolated, and some of them resembling decidual cells. There were also wandering plasma cells. In the mucous membrane papillæ were formed, the epithelia of the larynx proliferating over the papillæ and the remainder of the tissue. In various portions the epithelia extended in different degrees into the connective tissue beneath. The condition of the larynx resembled a condition of subacute inflammation.

In studying the patients, those in the last four to six weeks of pregnancy were placed in one class, while those in the earlier months of pregnancy were grouped in another.

In the first class were all those in whom, in the beginning, the larynx seemed to be perfectly normal. Of these there were 20; 14 primigravidæ and 2 multigravidæ, at the end of gestation; 3 in the sixth month; and 1 in the second month. The rhinoscopic and postrhinoscopic examination, where the larynx was found normal, showed also normal conditions in 6; in the others, the mucous membrane of the nose was found edematous and swollen and the nasal chambers reddened.

In the second group of 12 cases, the posterior wall of the larynx was reddened, with redness in the region between the cartilages; in 18 cases, 6 of whom were in the second and third months of pregnancy, the larynx and nasal passages were greatly changed. Both vocal cords were white, and the surrounding tissue reddened.

In a further group of 7 it was found that the vocal cords did not close. In 10 patients, one at four months, and the rest at the end of pregnancy, there seemed to be changes in the tissue between the cartilages. In one case the grayish red swelling in this region extended to such a point that the vocal cords could not be closed. In others the vocal cords seemed to be edematous, with marked injection of the mucous membrane in the posterior wall of the larynx. In some the posterior wall of the larynx was so swollen and reddened that in phonation the vocal cords did not close, but there remained a small three-cornered opening in the median line. Among these there were seven cases, one in the sixth month of gestation.

In the last group observed, the changes in the larynx were most pronounced. There were 6 of these: one in the third month; one in the fifth month; and the others at the end of gestation. The tissues were reddened and swollen, the spaces between the cartilages obliterated, the closure of the cords normal, but an abnormal amount of swollen mucous membrane was present.

In summarizing the cases, he found that the most characteristic changes were in the false vocal cords in the anterior surface of the cartilages, and in the region of the cartilages. The changes in the posterior wall of the larynx varied with the individual case. The appearance of the larynx suggests weakness of the internal muscles. Repeated pregnancies seem to increase these changes in each pregnancy. They are observed as early as the second and third months. There was a distinct relation observed between the progress of pregnancy and the changes in the larynx. The whole picture is that of an inflammatory swelling; somewhat similar changes have been observed by others who have examined the larynx of patients during menstruation.

It is interesting to observe that tuberculosis of the larynx is made rapidly fatal by pregnancy. In 231 cases 200 perished very shortly after the birth of the child. Catarrh of the larynx seemed also made considerably worse by the pregnant condition. This seems to be largely due to the fact that the integrity of the epithelia is destroyed, thus giving ready access to infective bacteria.

Pregnancy at Term Complicated by Mammary Cancer. MacLennan¹ reports the case of a woman, aged forty years, at full term, suffering from an erosion of the nipple and a lump in the breast. Three years previously the swelling in the axilla had disappeared, the patient thinking that it passed into the breast. She stated that the present growth, which had been there for six months, was increasing in size.

The nipple had been eroded for six weeks and was drawn inward and adherent beneath, and higher up in the breast. The lump in the breast was the size of an average apple, not especially hard, nor adherent to the chest wall, but infiltrating the breast. Except for the nipple the skin was healthy. The axillary glands were enlarged, but there was no pain or tenderness.

The case had been diagnosticated as mastitis. The patient was admitted to the hospital, the breast removed, the glands in the axilla dissected out as extensively as possible and from beneath the clavicle. The microscopic examination showed the tumor to be a carcinoma of rapid growth. The case did well.

I have recently had the opportunity to study the case of a patient, aged forty years, in her second pregnancy. There was a family history of malignant disease. During her first pregnancy she had a small

¹ Journal of Obstetrics and Gynecology of the British Empire, vol. xiii, No. 1.

painful area in one breast, which was incised, giving exit to fluid, which gave the patient relief. A severe spontaneous labor terminated in the death of the child from pressure. Afterward the family physician excised the growth in the breast under anesthesia. It was pronounced simple adenoma, and a positive and favorable prognosis was given.

The patient presented herself at five months in the second pregnancy, with a painful and hardened area at the site of the former excision. The axillary glands were not involved, and there was no retraction of the nipple. The patient was exceedingly suspicious and averse to surgical interference, and was under the influence and treatment of Christian Scientists. It was impossible to get her to consider the propriety of surgical interference.

During the next three months the breast progressively enlarged, the area became more and more painful and reddened, there was no essential anemia or leukocytosis, very little variation in temperature, and not much involvement of the general health. Obscure fluctuation developed with a sensation of great tension. The axilla remained apparently free.

The patient's suffering became so great that she finally requested surgical interference. At this time the macroscopic appearances were those of mastitis. Although malignant disease was kept constantly in mind, the characteristic signs of carcinoma were absent.

The patient was admitted to the hospital and the fluctuating area incised, when several ounces of straw-colored fluid was discharged. The cavity was curetted and drained with gauze, and the scrapings examined microscopically. The growth proved to be encephaloid carcinoma of a most rapidly growing and virulent type. Surgical interference of a radical nature was impossible, and the patient perished a few weeks after the incision of the fluctuating area.

The child was born before the death of the mother, but did not long survive.

The progress of the disease was not that of the usual form of carcinoma. The axillary glands could not be palpated, but the disease spread by the superficial and deep channels of the thorax. The anterior surface of the thorax became reddened and the lymphatic channels could be outlined by palpation. Some of the lymphatic glands about the clavicle could be palpated. It was evident that the deeper lymphatic glands were involved, as the patient had alarming attacks of syncope and disturbance in the action of the heart, probably caused by pressure upon the pneumogastric nerve. The other breast seemed to be sharing somewhat in the process. There was also acute maniacal delirium occurring suddenly at night.

The Histology of the Vagina and Bladder during Pregnancy. Hofbauer¹ has examined the vaginal tissues in eight cases of pregnancy, and

¹ Monatsschrift f. Geburtshülfe und Gynäkologie, 1908, Band xxix, Heft 2.

studied the histological conditions from this portion of the birth canal. Two of these were primiparæ, at the end of pregnancy dying of eclampsia. The third case was a multipara, whose death occurred in the middle of pregnancy from diabetic coma.

In these cases the epithelia of the vagina had entirely lost its original character, the usual pavement epithelium having disappeared, and in its place a stratum of cylindrical epithelium had formed. The deepest layer consisted of cells, the nuclei of which were elongated and oval with the long axes parallel. The layer of cells upon this had a smaller inferior end, and a broader superior and free surface, so that they are conical in shape with an oval nucleus. These cells suggested glandular epithelia. In addition to these there were found small papillary excrescences upon the superficial layers of the mucous membrane containing various sorts of epithelia.

The writer calls attention to the researches of Reterer, Salvioli, Latase and Holzbach, and Königstein, showing essentially the same result.

In the connective tissue of the vagina were found not only lymphocytes, but large oval and round cells resembling those seen in the bladder wall, as polyblast or plasma cells. Hofbauer thinks that possibly the altered condition of the mucous membrane of the vagina favors the passage of gonococci into the submucous tissue during pregnancy.

In studying the structure of the bladder he observed a thickening in the contractile elements in the muscle fibers. This seemed to resemble the growth of the round ligaments during pregnancy. This change seemed especially pronounced in the external layers of the bladder and in that portion of the ureter which passes into the wall of the bladder.

In the bladder wall of a patient dying from diabetic coma changes in the muscle of the bladder were seen upon cross-section. These resemble strikingly changes observed in the uterine muscle of the patient dying after spontaneous rupture of the pregnant uterus. As described by Geiroides and Nehrkorn, the muscle fibers seemed to be striped.

The connective-tissue septa of the muscle bundles were increased in width and in thickness. Round-cell infiltration, especially near the vessels, was observed, the type of cell being the mononuclear leukocyte with round nuclei which stained deeply. There were also observed cells alone or in aggregation, with excentral nuclei, the centre being clear and the periphery dull in its protoplasm, and in some portions vacuolated. These protoplasms stained clearly with eosine, but no eosinophile granules were observed. Some of these cells took the plasma staining observed by Unna and Jadassohn. They resemble in character the cells seen in the mucous membrane of the larynx in pregnant patients.

A subacute inflammatory process is most like the condition observed. The epithelia of the bladder proliferated in broad, solid masses, forming crypts in the deeper layers, which were separated from the submucous

connective tissue by small channels. There was a tendency in the mucous membrane to papillary growth. The cells of the deeper epithelial layers did not seem to be altered, but the protoplasm of the upper layers did not stain clearly. There were abundant wandering leukocytes amid the epithelia.

In the portion of the bladder near the ureters the muscular tissue and mucous membrane seemed much infiltrated with leukocytes, which extended among the epithelia and into the ureters. The wall of the ureters seemed so thickened that Sanger's observation that the ureters can often be palpated in pregnancy seemed reasonable. The papillae of the ureters in the bladder wall were prominent and widely open, and the finding of leukocytes in the urine during pregnancy so abundantly by Fischer, Trantenroth, and Saft, confirms the observation that leukocytes infiltrate the wall of the ureter extensively. The so-called inflammatory edema of the vesical portion of the ureters and the surrounding membrane of the bladder would interfere with the normal valvular action of the ureter, and may have an influence in the development of pyelitis during pregnancy.

Pregnancy and Labor Complicated by Cancer of the Rectum. Kynoch¹ reports a case of this unusual condition. The patient was a primipara six months advanced in pregnancy, and enjoyed good health until seven weeks before admission to the hospital, when she complained of diarrhea and painful defecation. The former symptom became constant, and she had constantly recurring pains in the rectum. She had also lost in weight.

On examination the patient was thin and anemic, with a newgrowth infiltrating the anal margin of the rectum and destroying the sphincter. Internally, the lower three inches of the rectum was involved in a large warty growth beyond which the finger could not reach.

A microscopic examination of a piece of the tumor showed it to be colloid cancer.

The vaginal canal was so encroached upon by the growth as to render it very doubtful if a full-term child could be delivered. The os admitted the finger, the vertex presented, and the membranes were intact. The patient declined to remain in the hospital, but was treated at her home until the seventh month, when labor was induced and a stillborn child delivered by forceps applied at the outlet. The patient died about a month after delivery.

The writer adds microscopic illustrations of the tumor, and quotes Nijhoff's paper,² in which 26 collected cases are summarized. The ages of these patients varied from eighteen to forty-three years. The cases are divided into three groups:

First, 5 in which rectal cancer was not diagnosticated until after labor.

¹ Journal of Obstetrics and Gynecology of the British Empire, August, 1908.

² Zentralblatt f. Gynakologie, November 28, 1905.

The disease was inoperable in 4; two mothers died of peritonitis, 1 on the fourth and the other on the eleventh day after delivery. In 1 case the tumor was excised three months after confinement.

The second group includes inoperable cancer of the rectum recognized before or during labor. Of these there were 16 cases, with 4 normal full-time labors, 2 premature, 1 spontaneous, 1 induced, 7 celiohysterotomies, and 3 Porro operations.

Of the 7 celiohysterotomies, five mothers recovered and all the children; in the 3 Porro operations, two mothers recovered and one child; in 2 cases inguinal colotomy was done early in pregnancy, followed by Cesarean section at full term.

The third group of cases comprised operable rectal cancer diagnosed during pregnancy. In 3 of these labor was induced, followed by Kraske's operation. In one the tumor was extirpated at the fourth month, followed by abortion on the fourth day, and the death of the mother from peritonitis the next day. In the fifth case, the tumor was extirpated at the fourth month, pregnancy continued, and the patient was delivered normally at full term.

The obstetrical management of these cases depends upon the degree of pelvic obstruction produced by the cancer. In some cases normal labor at full term can happen. In others it may be necessary to induce premature labor, or perform Cesarean section. If the growth is operable, it should be removed with the least possible delay. There is some discussion as to whether this should be done during the course of pregnancy or after the uterus has been emptied. So far, but one case is reported in which the disease was removed at the fourth month of pregnancy, labor afterward occurring normally at full term.

In addition to the Nijhoff collection of cases, Demlin and Condert¹ have published a case treated by celiohysterectomy. The child lived, but the mother died on the fourteenth day.

Pregnancy Complicated by Peritonitis. Cuff² contributes a paper upon this subject treating of the various causes producing peritonitis. He recognizes the fact that conditions producing peritonitis in the non-pregnant occurring during pregnancy are often more severe, the prognosis graver, and the results more serious than in the non-pregnant. They are also more difficult of diagnosis. He has found that the more usual causes of peritonitis in women are appendicitis, salpingitis, rupture, complete or partial, of ulcers of the stomach, inflammatory changes, ovarian cysts with or without torsion of the pedicles, and degenerative changes in uterine fibroids.

Peritonitis due to salpingitis is rare during pregnancy, probably because patients suffering from salpingitis do not so often become pregnant. Gastric ulcers are not very frequent in pregnant women. In the present

¹ Zentralblatt f. Gynäkologie, November 2, 1907.

² British Medical Journal, July 4, 1908.

state of surgery, major operations upon pregnant women cannot be considered as efficient causes for peritonitis. All of the usual operations of abdominal surgery, including resection of the intestine for obstruction, may be performed with the recovery of the patient without the interruption of gestation.

Cuff believes *appendicitis* to be comparatively infrequent in pregnancy. It is serious because the tendency to abscess formation is greater, and the pregnant condition predisposes to the breaking down of the abscess wall and resulting infection. He quotes Heaton's statement that in 86 per cent. of the cases in which pus is formed the pregnancy is interrupted. The contracting womb breaks down adhesions, and spreads pus into the abdomen and possibly into one or the other of the Fallopian tubes. The symptoms are especially obscure, for some of them are often seen in pregnancy.

Beginning abortion has often been mistaken for appendicitis, and sometimes sepsis following abortion is confused with this condition. Cuff describes the case of a primipara sent to the hospital for supposed abortion at the fourth month with septic infection. On admission, the patient had a dry, furred tongue, pulse 120, temperature 103°, and a rigid and tender abdomen. The tenderness and rigidity were very marked in the right iliac fossa. There was vaginal hemorrhage, which was not offensive; the os was open and contained a clot; the uterus was enlarged, painful upon motion, but nothing further could be elicited by examination.

The history showed that the illness began while the patient was in bed, with vomiting, tenderness, rigidity upon the right side of the abdomen accompanied by high temperature, and an offensive vaginal discharge. The operation revealed a large abscess behind the uterus, with a cancerous appendix, and the uterus and right Fallopian tube coated with lymph. The patient recovered.

Attention is also called to the close resemblance between pyelonephritis of pregnancy upon the right side and appendicitis. Other conditions confusing pregnancy and appendicitis are. lead colic, threatening abortion, and some infections of the lower thorax complicating pregnancy.

The treatment consists in all cases in prompt operation, the benefits of which are illustrated by a case reported by the writer in the seventh month of pregnancy when the typical signs of pregnancy were present. Upon operation a small collection of sero-pus was found on the outer side of the head of the cecum, the appendix leading thence behind the uterus, where it was acutely kinked on its long axis. Lymph had formed on the back of the uterus, and with the removal of the appendix and the use of a fine drainage tube at the bottom of the cecal region the patient made a good recovery.

The appendix was long, swollen, acutely inflamed, and covered with flakes of yellow lymph.

Torsion of the pedicle of an *ovarian tumor* complicating pregnancy can also cause peritonitis. Cuff estimates that these complications occur in 10 per cent. of patients having ovarian tumors. If the presence of a cyst is already known, the occurrence of pain, collapse, vomiting, rigidity, tenderness, and fever will lead to a correct diagnosis. Only abdominal section can make this positive, and this should be done as soon as possible.

Abortion is very common in these cases. The writer described the case of a patient four months pregnant, with symptoms of acute abdominal infection, although a tumor could not be recognized until the patient was anesthetized. A cyst of the right ovary with twisted pedicle containing sixty ounces of blood-stained fluid was removed, followed by recovery, without the interruption of pregnancy.

Acute degeneration of uterine fibroids complicating pregnancy may be followed by necrosis. While this condition is usually aseptic, the absorption of toxins from the tumor produces acute toxemia, and bacteria from the intestine may cause the development of peritonitis.

Cuff reports the case of a patient four months pregnant complaining of severe pain in the abdomen, and constant vomiting. She had suffered for four or five months with increased frequency of micturition. Menstruation had been regular but painful up to five months preceding. There was general abdominal distention with tenderness and evident toxemia. The fundus was above the pubis, and attached to its upper left angle was a tumor as large as two fists, very thin and movable. It seemed probable that it was an ovarian growth with a twisted pedicle.

At operation the tumor was found to be a fibroid, attached with a wide base to the pregnant womb. Below it was a smaller one. These were readily enucleated and the wounds closed with catgut. There was beginning peritonitis opposite the situation of the tumor.

On the tenth day the patient, in attempting to vomit, burst open the abdominal wound, and serous fluid escaped. The wound was again sutured, the patient recovered, and at term gave birth to a living child.

The tumor was dark red in color and necrotic. The capsule was roughened and showed minute hemorrhages.

Suppurating Hydatid Cysts Complicating Pregnancy. An interesting case of this unusual condition is described by Blacker.¹ The patient was eight and a half months pregnant. She also had an abdominal tumor which had been first recognized nine years before during an attack of abdominal pain, nausea, and vomiting.

On admission to the hospital the child was living, and its heart and funic souffle could be heard. Behind the womb was a rounded, soft tumor, apparently attached to the posterior surface of the supravaginal cervix. This could not be pushed out of the pelvis. Its upper limit could not be reached by rectal examination. The general health of

¹ Journal of Obstetrics and Gynecology of the British Empire, November, 1908.

the patient was good, and the tumor was thought to be a fibroid growth in the cellular tissue of the cervix.

As labor was impossible, a Porro operation was performed (in 1896), with the use of the wire loop and pins. The child did well, and no attempt was made to remove the tumor, which was in Douglas' pouch, firmly attached to the surrounding tissue. On the fifth day the patient had fever, with pain on the right side. On the ninth day pus was found, and on the eleventh day, after a good deal of the stump had come away, an hydatid cyst presented behind the stump. A number of these were gradually discharged, and the patient suffered from an attack of delirium, feebleness, fever, and redness of the skin. This was thought to be due to iodoform poisoning, and this antiseptic was omitted in dressing the stump.

For four weeks after the operation portions of hydatid cysts were discharged with a large quantity of fluid. On one occasion, calcareous matter was removed by forceps from the wall of the cavity. The patient apparently recovered and left the hospital; but in three weeks afterward she was again admitted and a large quantity of pus and a piece of the cyst wall were removed. With free drainage the tumor finally completely discharged, and the patient recovered.

Had the case been operated upon at present, it is possible that the Porro operation would not have been selected. As it was, this operation facilitated the discharge of the hydatid tumor, saved the life of the child, and thus contributed very largely to the patient's recovery.

Pregnancy Complicated by Ovarian or Fibroid Tumors. Obstetricians are practically agreed that pregnancy complicated by ovarian or fibroid tumors of the ovary or uterus should be treated by operation. The tapping of dermoid cysts per vaginam, the pushing upward into the abdomen of ovarian tumors, thus obstructing labor, the effort to deliver the child by forceps through a pelvis partly obstructed by uterine fibroids, have all proved so uncertain and so unsatisfactory in comparison with abdominal section that they have been abandoned. The consideration of this subject resolves itself into the diagnosis of these tumors and their removal by operation.

In some of the preceding numbers of *PROGRESSIVE MEDICINE*, I have already alluded to the fact that abnormalities in the pelvic and abdominal organs obscure pregnancy, and that also the pregnant condition often renders the exact diagnosis of pelvic and abdominal disease difficult. Cases are not infrequently seen in which it is impossible, with absolute accuracy, to recognize the condition present. It is known that the patient is ill, that pregnancy is probably present, and that in addition a physical change of considerable importance has taken place in the viscera of the pelvis or abdomen. Under these circumstances operation offers the only certain and reliable method of diagnosis and treatment.

Kerr¹ reports the case of a primipara several months pregnant whose abdomen very rapidly enlarged. There was pain in the lower abdomen; with irritability of the bowels and bladder. On examination the abdomen was distended with a bilobed swelling extending on the left beneath the ribs, and on the right to the umbilicus. Both tumors were elastic, the right firmer than the left. No heart sound or movement could be detected, but there was a distinct souffle over the lower part of the right tumor. On vaginal examination the uterus was pushed to the left, and the lower portion of the tumor bulged downward into the right vaginal fornix.

On abdominal section the tumor was found to be an ovarian cyst the size of a normal liver, developing from the left ovary. The patient made a good recovery, and pregnancy was uninterrupted.

Kerr also reports the case of a multipara admitted to the hospital after being more than twelve hours in labor. The forceps had been applied and attempts at delivery made during two hours without success.

The patient had known that she had a tumor for some time, and in the preceding pregnancy forceps had been used and delivery effected with difficulty. When admitted to the hospital she was having strong labor pains, and a large, hard, smooth tumor was felt near the symphysis, and above this the fetal head.

On section, the child was resuscitated with difficulty, the back of the head being badly bruised with forceps. The uterus was emptied, the uterine arteries tied with some difficulty, and the stump covered with peritoneum. The tumor was a solid ovarian of the right side, low in the pelvis, and adherent to the bowel and fascia. It was removed and its pedicle ligated.

The patient lived forty-eight hours after the operation, the pulse never falling below 130 to the minute.

Kerr has operated on 7 cases of tumor obstructing the birth canal during pregnancy; 5 of these cases had not aborted, and in 2 the pregnancy had been interrupted.

Cumston² reports five cases of ovarian cyst complicating pregnancy. The first was that of a dermoid the size of a fetal head, discovered during the fourth pregnancy. Operation was performed when pregnancy was nine weeks advanced. After the removal of the tumor light uterine contractions developed which were controlled by sedatives, the patient going to term and giving birth to a living healthy child.

In the second case the patient had severe abdominal pain, with vomiting, chills, and slight rise of temperature. These symptoms gradually subsided, and examination revealed a two months' uterine pregnancy, and behind the uterus a cystic tumor. On section, the cyst was found to be adherent, with a twisted pedicle, and containing dark-

¹ Journal of Obstetrics and Gynecology of the British Empire, January, 1908.

² Ibid., September, 1908.

reddish fluid. The patient made a good recovery and the pregnancy went on to term.

In the third case the patient had had two normal pregnancies, and was four months advanced in the third pregnancy. There was considerable vaginal hemorrhage, and prolapse of the uterus had developed, with pain in the abdomen, and painful micturition. The cervix protruded through the vulva; the uterus was retroflexed and in the pelvic cavity. The tumor extended above the umbilicus.

On section, an ovarian cyst on the right side, not adherent, was found. This had displaced the uterus and caused torsion of the womb. After the removal of the cyst the uterus was readily brought into normal position. This patient made a good recovery and pregnancy was uninterrupted.

In the fourth case the patient was pregnant for the first time, about five months. Ten days before examination she had very acute pain in the abdomen, which was greatly enlarged. The percussion note was clear over the abdomen, except in the left hypochondrium, where tympany was found. Fluctuation could be detected, and the bases of both lungs were displaced upward. There was also fluctuation in the posterior vaginal cul-de-sac.

On section a quantity of sticky fluid escaped, and it was found that the wall of the cyst was adherent to the peritoneum. The cyst was separated with difficulty and its pedicle ligated. The pregnant uterus assumed its normal position; the patient recovered without complication, and pregnancy continued to full term.

In the fifth case there was a mobile, elastic tumor behind the uterus upon the left side. Posterior colpotomy was performed and a cystic tumor found and easily delivered. It proved to be a dermoid, its pedicle was readily ligated, and the cyst removed. The incision was closed and the patient recovered, the pregnancy continuing to term.

Cumston believes that cystoma complicated by pregnancy is more frequent than is usually admitted. Evidently many patients having small tumors pass through pregnancy without much inconvenience. Torsion of the pedicle occurs in about 8 per cent. of these cases, and in some the tumor decreases in size during pregnancy. Such a tumor may produce premature birth, and if the pedicle becomes twisted, peritonitis and toxemia may develop.

Bland-Sutton¹ contributes a paper upon abdominal hysterectomy for fibroids, in London. In 1896, 49 operations were performed, with 11 deaths. In 1906, ten years later, 348 operations, with 11 deaths. Bland-Sutton, during the years 1906 and 1907, performed abdominal hysterectomy for fibroids on 101 patients, all of whom recovered.

He states that the belief that fibroids disappear at the menopause

¹ British Medical Journal, July 4, 1908.

is a bubble that has been pricked by the scalpel. He believes that submucous fibroids may predispose to cancer of the womb, and that the combination of fibroids in pregnancy is a dangerous condition. What is termed "red degeneration" is especially likely to occur in fibroids in a pregnant uterus, and has the extraordinary effect of rendering them painful. These conditions may occasion confusion in diagnosis because the growths may simulate an acute inflammatory condition.

A considerable number of hysterectomies in the early stages of pregnancy are performed without knowledge that the patient is pregnant. The condition is often recognized only after the womb has been removed and laid open. Many abdominal myomectomies are done upon a mistaken diagnosis. These tumors have undergone red degeneration, and the pain which accompanies this change may occasion confusion in diagnosis. It is so sudden and acute that it resembles the pain from an ovarian cyst with an acutely twisted pedicle, or the shock produced by the bursting or abortion of a pregnant Fallopian tube. Experience shows that an operator can never be certain regarding the nature of the tumor until the abdomen is opened, and sometimes even then mistakes arise. Operation has been undertaken for a supposed ovarian tumor complicating pregnancy, which proved to be a fibroid, a tumor of the pelvic wall, a dislocated spleen or kidney, a tubal pregnancy, a lithopedion, or a calcified hydatid cyst.

Olshausen removed a pregnant uterus which he supposed contained a cystic fibroid, which would obstruct labor. The tumor proved to be a large sacroteratoma growing from the fetus.

The child may first be expelled, followed by a submucous fibroid. This may so much resemble a fetal head that it has been mistaken for the head of a second twin, and forceps have been applied to it.

Error sometimes occurs in diagnosing the nature of a tumor at operation. Bland-Sutton cites a case in which Cesarean section was performed because delivery was obstructed by a tumor. This was so firmly wedged into the pelvis that it was considered a sarcoma growing from the pelvic bones, and irremovable. Four years later the woman came under his observation, and he removed the tumor, finding it a solid ovarian fibroid. The patient made a good recovery.

The Porro operation has been performed for a case of supposed calcified fibroid obstructing labor. A week afterward the wound above the stump opened and hydatid vesicles were discharged, the tumor proving to be a calcified hydatid cyst.

In pregnancy complicated by fibroids, Bland-Sutton would keep the patient under observation until the child is viable. Premature labor sometimes occurs and the child is born without difficulty. Should serious dystocia occur, the child can be delivered by Cesarean section, and the uterus with its fundus can be removed by any method selected by the surgeon.

The records of hospitals show that the majority of pregnant patients having fibroids of any size require operative assistance during labor. Bland-Sutton believes that while ovarian tumors usually give more trouble than fibroids during pregnancy, that fibroids are more fatal because their presence is frequently associated with the development of septic infection.

McMurtry¹ believes that uterine fibromata and pregnancy are rarely associated, and that surgical interference is necessary only in selected cases. These tumors increase in size during pregnancy, and may undergo necrosis through torsion of that portion of the womb which forms the pedicle of the tumor. A fibroid tumor of the womb may obstruct the Fallopian tube in such a manner as to cause ectopic gestation. When the tumor occupies a considerable part of the fundus, the ovum and placenta may become implanted low in the uterus, causing placenta prævia. Breech and shoulder presentations not infrequently develop. Pain resulting from abnormal pressure during the latter months of pregnancy, and the patient's knowledge that an abnormal condition complicates gestation, are factors of importance. The mortality in cases not treated by operation is considerable.

McMurtry reports 4 cases, the first of which was a myomectomy for two subserous tumors, one having a broad pedicle, the other being sessile. The patient recovered without the interruption of pregnancy.

His second case was that of a patient five months pregnant, in whom the pelvis was filled with an interstitial uterine fibroma. The uterus was removed, and upon section the fetus was found in the upper portion of the mass. The patient made a good recovery.

In the third case, the patient at eight months was delivered of a dead child. The placenta was retained, the patient became septic, and supravaginal hysterectomy was performed, followed by recovery.

In the fourth case a large tumor filled the entire pelvis, and the patient was pregnant. The child was delivered by Cesarean section, followed by supravaginal hysterectomy, which was completely successful.

Ectopic Gestation: Extramembranous Pregnancy. Under this title, Tantzsch² describes hydrorrhea gravidarum amnialis, and refers to twenty similar observations reported in the last ten years in German medical literature.

The two forms, decidual and amnial, are both found most frequently in multiparæ, and both develop from endometritis complicating pregnancy. In the decidual form a copious secretion occurs from the glands between the decidua vera and reflexa. The secretion is watery in character, and the condition does not necessarily interrupt pregnancy, nor does it seem to harm the child.

In the amnial form there is a free discharge of watery fluid, as in the

¹ Surgery, Gynecology, and Obstetrics, March, 1908.

² Zentralblatt f. Gynäkologie, 1908, No. 27.

decidual. The membranes, however, rupture with a single or repeated discharge of water mixed with blood, and pure blood may be discharged at this time or afterward. Evidently the lesion in the endometritis preceding the amnial variety has led to greater changes in the tissues than in the decidual. Such are found most developed in the placenta, which is often circumvallate. The cause of the rupture of the membranes must be found in pathological changes in these tissues through interference with their nutrition. Pregnancy, however, for some time is not interrupted in these cases, the fetus passing out of the membranes into the cavity of the uterus and the pregnancy becoming extramembranous or extra-ovular. The fetus rarely goes to full term, and the development of the child is influenced by its abnormal condition. In a few children who reach viability the extremities show stiffness, with lack of development, because of the lessened space in which the fetus grows. The discharge of pure blood, or blood mixed with amniotic liquid, serves to differentiate this form from the decidual. In some cases the first evidence of the condition is found in hemorrhage, and afterward discharges of watery fluid occur. The bleeding must be referred to inflammatory changes in the decidua.

Pfeilsticker¹ has collected 21 undoubted cases, and 4 probable cases of amnial hydrorrhea.

Tantzsch's case is as follows: The patient had borne six children and had nursed them all. She was brought to the hospital because of profuse hemorrhage which had occurred several times in the last two months of her pregnancy. From the size of the uterus it was estimated that the patient was seven months advanced. The first hemorrhage occurred at night, and was slight, but was followed later by severe bleeding. The discharge of brownish fluid persisted, followed by repeated hemorrhage.

On examination, the patient was pale and anemic, the abdominal tissues much relaxed, and the fetus was in transverse position. Repeated examinations failed to find evidence that the fetus was living.

About two months after the first hemorrhage the patient entered the hospital, and a stillborn child in breech presentation was extracted. Immediately after its delivery there was a discharge of dark blood, and an hour afterward the placenta was delivered and found to be completely anemic. In the membranes was observed the aperture through which the fetus had escaped. There were portions of the membrane attached to the umbilical cord. Examination of the fetus showed that its escape from the membranes must have occurred about a month before its birth. The pregnancy had evidently been extramembranous.

SIMULTANEOUS INTRA- AND EXTRA-UTERINE PREGNANCY. Immel² reports the case of a patient who had had two normal pregnancies and

¹ Archiv f. Gynäkologie, Band lxxvii, p. 636.

² Monatsschrift f. Geburtshülfe und Gynäkologie, 1908, Band xxvii, Heft 1.

labors, and an abortion in the seventh week of pregnancy. She was suddenly taken with lancinating pain in the lower abdomen so severe as to render her almost unconscious. The pain subsided, but was followed by hemorrhage, which caused the patient great anxiety. Both ceased when the patient remained perfectly quiet in bed. Another attack occurred, however, so violent, and accompanied by vomiting, that the patient seemed about to die. She remained unconscious for some time.

A diagnosis was made of peritonitis in the region of the diaphragm. On admission to the hospital the patient was in shock, the pulse being 138 to the minute.

On examination, the uterus was found enlarged and corresponded to about a two months' pregnancy, while upon the left side of the womb the patient complained of severe tenderness and pain upon manipulation. The hemoglobin had become reduced to 50 per cent.

On section a large quantity of dark blood was found in the peritoneal cavity. The uterus was about two months pregnant, and a perforation in the left Fallopian tube, with tubal pregnancy, was the site of the hemorrhage. After the removal of the tube the patient made a tedious recovery complicated by anemia.

The interesting question arises as to whether this condition was the result of simultaneous conception in two ova, or whether conception occurred at two different periods. Some light may be thrown upon this by the development of the two embryos in these cases. The intra-uterine embryo was evidently from eight to ten weeks advanced; the extra-uterine seventeen days. Corpora lutea, accounting for both pregnancies, were found in the left ovary, one of which was one and a half times as large as the other.

As regards the prognosis, Werth reports 5 per cent. of cases in which repeated tubal pregnancy was observed; while Scanzoni believes in 17 per cent. of cases treated by operation. With the preservation of the second tube a normal intra-uterine pregnancy developed.

ABDOMINAL PREGNANCY. Jarzeff¹ discusses the possibility of primary abdominal pregnancy. He believes that a genuine abdominal pregnancy occasionally presents itself, although rarely. It is impossible in the present state of our knowledge to definitely assert whether the ovum has undergone primary implantation in the abdominal cavity, or whether it has been extruded after impregnation from a gravid tube.

He reports the following case: The patient had not previously been pregnant. After slight interruption to menstruation, she was taken with severe pain and copious vaginal hemorrhage, which were ascribed to delayed menstruation. These were repeated, and the patient entered the hospital.

¹ Monatsschrift f. Geburtshülfe und Gynäkologie, 1908, Band xxviii, Heft 2.

On admission she was anemic, the abdomen somewhat distended and very painful, especially in the lower portion. Upon vaginal examination in the posterior wall of the vagina there was marked resistance and tenderness. The patient was put at rest with an ice-bag upon the abdomen. Under this treatment the tenderness became less and a bimanual examination was made. The uterus was anteflexed and apparently not enlarged. A tumor in the pelvis could be made out as large as a fist, elastic and movable.

Upon section through the posterior vaginal wall adhesions were separated with the finger. After removing blood clots, the tumor was found behind the uterus, and from this emerged an embryo 1 cm. long. The tumor upon the left side proved to be a dermoid cyst, and after it was emptied it was separated from the uterus, its pedicle ligated and removed.

A similar tumor was removed from the right side, and the opening in the posterior vaginal wall was drained with iodoform gauze. The patient made a good recovery.

Upon examining the specimen, the tumor on the left side consisted of an ovarian cystoma, which was dermoid. The corpus luteum was present in the wall of the cyst. On the outer surface the tube throughout its length was adherent, the tube seeming to be perfectly normal.

On microscopic examination, it showed the presence of inflammatory elements. The right cyst was of the same size as the left, with two dermoid cavities.

When section was made of the tube, the three membranes surrounding the embryo could be plainly made out, the amniochorial with its villi, and the connective-tissue envelope, which in these cases took the place of the decidual membrane. The study of the specimens led to the belief that in addition to the dermoid cysts on both sides, an ectopic pregnancy had developed which had formed a hematocele. In both cysts there was no trace of embryonal tissue. The ovum was found in the right cornu of the uterus, 3 cm. from the abdominal opening of the tube. A tubal abortion could not be proved in this case by a microscopic examination. The connective-tissue membrane which took the place of the decidua did not resemble a pregnant tube, but seemed to be a newly developed membrane, or the result of an inflammatory process in the peritoneum.

In view of the fact that no trace of the embryo could be found in the tubes or cysts, the case must be considered as one of abdominal pregnancy, with accompanying dermoid cysts, and intra-uterine pregnancy as well. It is possible that the ovum had first become attached to the mucous membrane of the tube, and thence had been expelled and attached itself to the surrounding peritoneal tissue.

The Toxemia of Pregnancy. This interesting subject continues to attract attention and elicit the study of obstetricians and pathologists.

It is now well recognized that the condition of the kidney marked by the presence of casts and albuminuria is a phenomenon secondary to toxemia. The primary condition is an essential alteration in the structure and function of the liver, intestine, and ductless glands. In some patients this process may continue to a fatal issue, the kidneys remaining intact; in others the kidneys share in the pathological lesions early in the progress of the disease. The obstetrician must be prepared, if possible, to diagnosticate the condition before it has reached the point where eclampsia is inevitable.

This can be done by experienced observers in most cases by physical examination of the patient. Persistently altered pulse tension, chronic constipation, diminution in the quantity of excreta, both solid and liquid, disturbances of digestion, altered conditions of the nervous system shown by headache and neuralgia, all are symptoms capable of appreciation without laboratory research.

When, however, it is available, the examination of the blood, especially by controlled injections of its serum, and the nitrogen partition of the urine confirm the diagnosis made by physical signs.

The therapeutic test for the presence of toxemia is found in the success of treatment causing vigorous elimination and also in the improvement of the patient which follows in many cases the administration of thyroid extract.

The microscopic examination of the urine gives knowledge only of the degree of pathological change present in the kidney.

It is now recognized that the pernicious nausea of pregnancy is toxemic in origin, and that as pregnancy produces various disturbances of the general health, points to a continuation of the process whose manifestation in early pregnancy was pernicious nausea.

The recognition of the part played by the embryo and fetus in this process may be effected by observing the impaired development of the fetus in severe cases, and confirmed by the gross and microscopic examination of the product of conception after its expulsion. The premature death of the embryo or fetus illustrates the conservative process of nature and its endeavors to guard the life of the mother at the expense of that of the child.

Champneys¹ contributes a paper upon this subject in which he draws attention to the writings of Matthews Duncan, who described conditions of the liver and other glands of the body now recognized as the essential phenomena of toxemia. His views were not widely accepted, but have been abundantly confirmed by later research. Duncan believed that the vomiting of pregnancy was due, first, to neurosis; second, to toxemia. The first class of cases are rarely fatal; the second are extremely grave.

Champneys describes two cases, the first of which occurred in a woman

¹ *Journal of Obstetrics and Gynecology of the British Empire*, August, 1908.

who had a marked hereditary tendency to nervous disease. Two of her uncles were insane. There was no jaundice, the tongue was clean, the uterus developing normally and rising without obstruction into the abdomen.

The case was cured by rectal feeding, combined with the free use of bromide of potassium.

The second case was seven weeks advanced in pregnancy, with bilious vomiting, bile-stained fecal discharges, and emaciation. There was slight jaundice, the tongue was dry, the pulse very feeble and compressible and 140. The urine was dark brown in color, scanty, containing blood cells, epithelia, pigmented masses, casts, and leucin. A set of dilators resembling Hegar's, made to order by a village carpenter, were used successfully. Sponges and laminary tents failed to dilate the cervix. The patient recovered rapidly after the emptying of the uterus.

Wetherill¹ draws attention to obstetric, septic, and anesthetic toxemias. He reports five cases, one of acute toxemia following the use of chloroform for the removal of a six weeks' ruptured ectopic gestation. This patient vomited mucus, bile, and grumous blood; was jaundiced, and secreted little or no urine; and died in coma on the third day. She had violent delirium before death.

The second case was sapremic from self-induced abortion. The uterus was emptied and the pelvis drained by laparotomy under chloroform. Violent toxemia, with coma and death, developed in two days. At autopsy the liver was shrunken, yellow, and softened in patches.

In the third case, incomplete abortion was complicated by hepatic toxemia, with changes in the kidneys. The uterus was emptied under general anesthesia, but the patient rapidly developed acute toxemia, dying in twelve days from coma.

The urine, in addition to kidney debris, contained acetone and diacetic acid. At autopsy, the uterus was enlarged, softened, and partly filled with decomposing placental debris. The liver was small, yellow, and fatty, with multiple necrotic areas. The kidneys showed acute parenchymatous changes.

A fourth case is related in which the right kidney was removed for tuberculosis. During the operation, without the knowledge of the operator, the anesthetizer substituted chloroform for ether. The patient died six days after operation from overwhelming toxemia. Autopsy revealed a small yellow liver, and acute parenchymatous changes in the remaining kidney. There was no sign of septic infection in the womb.

In the fifth case the patient was pregnant five months, suffering from intense headache and dimness of vision; the urine was without albumin, but contained bodies pointing to hepatic changes. Uric acid was

¹ Journal of the American Medical Association, August 29, 1908.

greatly increased; indican and bile salts were increased, as was the ammonia. Acetone and diacetic acid were plainly present. There was nothing significant in the sediment.

Ophthalmoscopic examination showed neuroretinitis in each eye, with hemorrhage in the right near the nasal margin of the optic nerve.

Under proper dieting the patient was carried to the thirtieth week, when labor was induced. The forceps delivered a small stillborn child. The patient rapidly recovered.

Wetherill draws attention to the similarity in lesions between the toxemia resulting from chloroform, sapremic decomposing placental and fetal debris, and the auto-intoxication of overfeeding and drinking, with coprostasis. Urinary insufficiency with acidosis and high ammonia co-efficient, retinal hemorrhages, and neuroretinitis, the vomiting of mucous, bilious, or grumous matter, with or without changes, and with or without albuminuria, are the symptoms present in these cases.

Posey and Hirst¹ draw attention to the *ocular examination of pregnant patients with toxemia*. They report three cases in which marked symptoms of toxemia were present, and also the characteristic changes in the eye. They add a fourth case in which the usual symptoms of toxemia were absent, but in which ophthalmoscopic examination revealed characteristic changes, the condition promptly yielding to eliminative treatment and the induction of labor.

Foulkrod² reports seven cases of toxemia differing in severity, illustrating the different changes already described. In one case, with a much enlarged thyroid, the effort to produce increased elimination by giving thyroid extract, was followed by great swelling of the thyroid, with difficult breathing and intense headache. These symptoms subsided with the application of an ice-bag to the thyroid, and free elimination by the bowels and kidneys.

Another case presented the symptoms of acute hepatic toxemia, proving rapidly fatal. Chloroform was used in dilating the uterus and removing its contents.

In another case, the patient passed pure blood from the kidneys, with the usual symptoms of acute toxemia. She recovered after the emptying of the uterus.

Under the title, "The Toxicosis of Pregnancy," Fellner³ reviews the various writings upon the subject, calling attention to the symptoms which we have already described. Fellner describes two cases, in Schauta's clinic, of eclamptic psychosis, which disappeared after the emptying of the uterus. The symptoms developed suddenly two days after delivery of the child, and were relieved by removing portions of retained placenta from the uterus.

¹ Journal of the American Medical Association, March 14, 1908.

² American Journal of the Medical Sciences, October, 1908.

³ Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxix, Heft 1.

Fellner believes that it is not the metabolism of the fetus itself, but changes taking place in the placenta which cause this condition. He believes that there is a relation, probably of cause and effect, between placental changes and the occurrence of osteomalacia. There is a further relationship between these conditions and efficiency in the action of the ductless glands. After the removal of the ovaries there is increased functional activity of the thyroid, which checks the osteomalacic process. He believes that these changes in the metabolism of the body are exaggerations or deficiencies in normal processes.

He draws attention to the analogy between the physiology and pathology of menstruation and pregnancy. He believes that many of the phenomena of menstruation result from transient toxemia.

Alexandroff¹ reports from the clinic at Moscow a case of pernicious nausea complicated by Korsakoff's psychosis.

When the patient was seen she had already suffered for two weeks from pernicious nausea. The patient was pregnant but a few weeks, gave a good family history, but had been puny during the first sixteen years of life. At fourteen she had otitis media followed by deafness. After the eighteenth year she had frequent headache and vomiting. During the summer preceding, after bathing too long in a river shortly after dinner, she had a severe attack of headache and vomiting, which lasted for one month. The patient used beer and wine moderately.

On examination, the uterus was retroposed, movable, enlarged, somewhat softened, and the other portions abnormally hard. The tubes and ovaries were normal; the patient complained of no pain; and the urine was apparently normal.

Medical treatment failed to relieve the nausea, and the patient grew progressively worse. Shortly after leaving the hospital she was taken with symptoms of abortion, which subsided somewhat under the use of opium, ice, and rest in bed. The urine showed that a toxic process was proceeding, and a few days afterward vision became greatly impaired.

Examination showed apoplexy in both retinas. The patient gradually developed headache, restlessness at night, a pulse of 135, loss of patellar reflexes, pain in the large nerve trunks, and a flaccid condition of the muscles with muscular tenderness. These phenomena constituted the psychosis known as Korsakoff's. A contracture of the left knee shortly developed, and for two weeks the condition remained practically unchanged. Contracture in the right leg also began with great painfulness in the muscles, excepting those of the chest, back and face. The ocular condition improved, the patient had no hallucinations and slept better, the nausea and vomiting gradually disappearing. Just as improvement seemed to have established itself, the patient was taken

¹ *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1908, Band xxviii, Heft 5.

with a sudden and severe attack of asthma, with active delirium, tearing her clothing.

On examination, the cervix was found dilated sufficiently to admit the finger. It was evident that pregnancy could not continue, and accordingly the uterus was dilated by an elastic bag and emptied by the finger and a dull curette. A strip of iodoform gauze was inserted in the uterine cavity, and gauze was placed in the vagina.

The operation was done without narcosis. She gradually recovered with fair involution.

The patient was transferred to a psychiatric clinic. She improved in general health, but had hallucinations and headache and illustrated Korsakoff's psychosis.

THE TREATMENT OF PERNICIOUS NAUSEA BY SUGGESTION. Schulte¹ reports three cases of pernicious nausea complicated by hysteria, in which general treatment was successfully reinforced by rest to the nervous system and through suggestion. In addition to these, nervous sedatives were employed freely, with a liberal diet. The treatment was successful, the patients going to term and giving birth to living children.

THE TOXEMIC PERNICIOUS VOMITING OF PREGNANCY, WITH ESTIMATIONS OF TOTAL NITROGEN AND AMMONIA. Buhlig and Stowe² report the case of a young primipara who had mild nausea during the first three weeks of gestation. In the fourth and fifth months the patient greatly improved. From the beginning of the sixth month the nausea returned and continued until the eighth month. There was frequent headache and neuralgia in the face, arms, and pelvis.

On examination, the liver was tender on pressure, and extending slightly below the costal arch. Deep palpation over the right kidney caused great pain. The skin was covered with a typical toxemic eruption. The tongue was coated, the breath foul, the appetite poor, and constipation alternated with diarrhea. There was moderate edema of the lower extremities. The pulse reached 120 several times, the tension being stationary at 170 to 180. Labor was induced, and a living child was born, which died twelve days after of acute gastroenteritis. The mother recovered.

Examination of the urine showed a specific gravity of 1005, urea 0.5 per cent., a faint trace of albumin, no bile, no sugar, no blood, no acetone, no casts, but a considerable number of pus cells. Ammonia nitrogen was 8.6 per cent.

Eclampsia. In the present state of our knowledge of toxemia and eclampsia, we divide the latter into two varieties: That most frequently recognized, namely, eclampsia with convulsions; and that which is not so often diagnosticated, eclampsia without convulsions.

¹ Monatsschrift f. Geburtshülfe und Gynäkologie, 1908, Band xxvii, Heft 5.

² Surgery, Gynecology, and Obstetrics, August, 1908.

Both represent the highest expressions of toxemia and the results of those pathological processes in the organs of elimination which are so often fatal. The same nomenclature is applied to newborn infants, in whom one often sees death from acute toxemia without convulsions.

The essential phenomena of eclampsia are those connected with the nervous system. Violent headache, maniacal delirium, complete obscuring of the functions of the brain, great alterations in the vasomotor conditions in the body, paralysis of the secretory nerves, paralysis of the heat centre, and impairment in the action of the nervous mechanism of the heart, are just as much phenomena of eclampsia as are epileptiform convulsions.

A differential diagnosis must always be made between hystero-epilepsy and eclampsia. Just as pernicious nausea may be simulated by hysterical nausea, so genuine eclampsia, the result of toxemia, may be simulated by hystero-epilepsy; but in the latter the essential phenomena of eclampsia are absent, and the prognosis is uniformly good.

No case of eclampsia can be diagnosticated or treated intelligently except from the standpoint of toxemia. The differential diagnosis having been made in the absence of toxemia, the treatment is palliative, and the birth of the child will terminate the convulsions without further treatment; while in toxemic eclampsia the case demands the most intelligent discernment and skilful treatment.

Welch,¹ pathologist to the New York Lying-in Hospital, compares the lesions found postmortem in cases diagnosticated clinically as eclampsia and toxemia of pregnancy; twelve cases furnished the subject for study, and a description of the clinical history and autopsy findings is given in each.

The changes found in the liver are divided into four classes: The first comprise the hemorrhagic changes in and about the portal spaces, comprising 6 cases; 2 of these had no convulsions.

The second class includes 3 showing necrosis in the centre of the liver lobule. These patients had convulsions.

In the third class was one case without hemorrhage, but with a general swelling of the cells, with autolysis.

In the fourth class were 2 cases where the changes in the parenchyma of the liver consisted of a slight cloudy swelling without hemorrhage or necrosis. In these patients the kidneys showed marked disintegration of epithelia. In all of these the parenchyma of the kidney was markedly affected, but the degree of destruction of the epithelia varied greatly in various portions of the same organ.

Welch believes that one cannot base a prognosis upon urinary findings, because the kidney is diseased, and for that reason it is not certain whether it retains products which it should eliminate, or whether it excretes others it would normally retain. Nitrogen partition of the

¹ American Journal of Obstetrics, January, 1909.

urine is promising, especially when interpreted in the light of clinical observation. Hemorrhages and necrosis in the liver substances were recognized, but the question is raised as to whether this may result from multiple embolism.

Most of the cases showed a considerable hemolysis. In the liver hemorrhages the fibrils had a hyaline appearance resembling fused red blood cells and stroma. The condition in the parenchyma cells indicates in the blood the action of some dissolving poison. This agent may also attack the endothelium of the bloodvessels. The action of such a poison would explain the large brain hemorrhages which sometimes occur in young subjects, who are usually free from arteriosclerosis.

The poison causing this serious intoxication Welch thinks is probably an enzyme or a combination of enzymes. Normal cell metabolism is performed by these bodies, and if they be disturbed they will attack the cells and destroy them by autolysis. The liver cells are especially rich in these substances and here the greatest destruction is observed.

This poison may originate from the intestinal tract and kidneys, or from the fetus and placenta. Unquestionably poisons are often formed in the large intestine during pregnancy. The fact that one individual may develop toxemia while another does not, under apparently similar conditions, may be explained by the side-chain theory of immunity.

INVESTIGATIONS INTO THE POISONOUS PROPERTIES OF BLOOD SERUM IN ECLAMPSIA. Graf and Landsteiner¹ conducted experiments in the Pathological Institute in Vienna to determine the poisonous properties of the blood serum in eclampsia. They review the experiments of Rummo, Tarnier, Chamberlent, Bar, Renon, Ludwig, Savor, Volhard, and others.

Semb's experiments to determine the relative toxicity are also quoted. The writer's experiments were conducted upon rats by injecting eclamptic serum into the peritoneal cavity. To prevent the escape of the fluid an oblique incision was made through the abdominal wall, and the opening made by the cannula was ligated. The first series of injections were made with the serum from eclamptic patients; the second were control experiments with normal serum; the third series were control experiments with retroplacental serum from normal parturient women; the fourth were injections of venous blood from different diseases; while in the fifth the results of injections in various animals were compared.

In the thirteen injections made after venous section of sterile blood obtained at surgical operations, one animal perished which had received 15 per cent. of its body weight. Those who received but 12 per cent. remained alive, without symptoms, except a slight disturbance caused by the injection. Apparently 12 per cent. marks the safe limit of the absorption of such serum.

¹ Zentralblatt f. Gynäkologie, 1909, No. 4.

Forty animals were injected with retroplacental serum, and the animals perished when the injection rose above 15 per cent. of the body weight. The lowest percentage causing disease was 8, six hours after injection.

There were 19 cases in which the serum of eclamptic patients was injected, and in 13 the toxicity of the blood was certainly greater than normal. The poisonous dose varied from 2 to 10 per cent. of the body weight of the animal. The longer the serum stood after its removal from the body the greater became its toxicity. There can be no doubt of the greatly increased toxicity of the blood serum in eclamptic patients. Animals injected with eclamptic serum showed before death lassitude, irregular and difficult respiration, diarrhea, a very dark colored urine, and often clonic and sometimes tonic contractions, especially in the muscles of the neck. These came on spontaneously, or could be easily excited.

At autopsy there was found in the abdomen, and often in the pleural cavities, a reddish fluid. There were areas of edema beneath the skin. The same appearances were observed in the animals injected with the blood serum, who were suffering from other diseased processes besides eclampsia. Similar appearances were seen in six rats killed by the injection of a specific hemolytish immunizing serum from rabbits' blood, and hemoglobin was present in these cases.

From these experiments the writers conclude that it is not so much the formation of a new poison in the serum as a great increase in the quantity of poisonous substances normally present, which is observed in eclampsia.

The recent paper by Leipmann¹ reports the results of his observations to determine the part played by the *placenta in eclampsia*. He employed for comparison the normal placenta, in powder and in emulsion; and the placenta from eclamptic patients in emulsion, powder, and with intravenous injections. He believes that experiments in this line point clearly to the fact that the placenta forms and contains a considerable portion of the poison responsible for the eclampsia.

Brindeau and Nattan-Larrier² have also contributed a paper upon the placenta in eclampsia. They draw attention to the infarcts which have been reported by others, and also to the vascular changes and edema in the placenta of these cases. They place especial stress upon the placental hemorrhages accompanying eclampsia. They divide these into apoplexies, hemorrhages, and retroplacental. In one instance the clot in a retroplacental hemorrhage reached the size of from 1200 to 1500 grams.

A microscopic study of the placenta in eclampsia is largely that of vascular lesions. The vessels are greatly distended, ruptured in some

¹ Zentralblatt f. Gynäkologie, 1909, No. 4.

² L'Obstétrique, February, 1908.

places, giving rise to red patches, in which may be recognized three zones: A central zone formed by red blood corpuscles and filaments of fibrin; a peripheral zone largely composed of fibrin filaments; and an external zone formed of numerous villousities.

They also draw attention to the plasmoidal alterations in the placenta in the form of nodular hypertrophies alternating with zones of atrophy, and an increase in the villi. They further noticed changes in the chorion and amnion of the placenta, with edema.

They summarize the endometrial lesions as hemorrhagic endometritis with interstitial hemorrhages and diffuse infiltration with leukocytes. They recognize these lesions as the result of a widespread toxemia.

Albeck and Lohse¹ have made experiments to determine the source of the poison and its isolation in eclampsia. Their experiments were made by obtaining the *amniotic liquid* in eclamptic patients and injecting this into animals, and determining the organic lesions produced by such injections. Their experiments showed that the amniotic liquid in eclampsia contains a poison which when injected into animals produces convulsions and death, with alterations in the liver resembling those seen in women dying from eclampsia. Necrosis of the liver in various stages was the lesion observed.

To determine the relation between the *suprarenal capsules in eclampsia* and *nephritis in pregnancy*, Chirie² made autopsies in twenty-eight cases on patients dying from various causes, including eclampsia during pregnancy. These autopsies showed that in eclampsia, retroplacental hemorrhage, and the nephritis of pregnancy there is found a cortical hyperplasia, and less frequently medullary hyperplasia in the suprarenal bodies. The cortical lesions are in relation with the antitoxic function of these glands, and probably also with the angiotonic, although the two cannot be distinctly separated. In cases where medullary hyperplasia is present there is usually hypertrophy of the heart. The angiotonic function of these bodies appears to be established, but the exact mechanism in the normal gland is unknown, and it is impossible to exactly appreciate the relation existing between the gland and hypersecretion and hyperarterial tension with hypertrophy of the heart. In most of the cases the suprarenal lesions are secondary to lesions in the kidneys themselves.

Mirto³ writes a paper drawing attention to the relationship existing between the *weight of the fetus and placenta* in cases of eclampsia. His researches show that the placenta is usually greater in weight in eclamptic patients than in those who have a physiological pregnancy. The disproportion is greatest in cases of acute toxemia where the size of the placenta is markedly diminished.

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1908, Band lxii, Heft 1.

² L'Obstétrique, April, 1908.

³ Annali di Ostetricia e Ginecologia, 1908, No. 9.

Dinst¹ has made observations upon the *blood in eclampsia by cryoscopy* to determine, if possible, the origin of eclampsia. He believes that in eclampsia there is a retention in the blood of albuminoid materials which ordinarily are excreted. Some of these are fetal albuminoids passing from the fetal portion of the placenta into the maternal, and thence into the maternal blood. The albuminoid content of the blood plasma in the mother is greatly altered. The albuminoid contents seem somewhat lessened, the quantity of water increased, and neither globulin nor serum albumin seem to be increased. The fibrinogen seemed also lessened.

Dinst found also in a high degree hyperleukocytosis in eclamptic patients. The origin of these leukocytes is the blood in the umbilical vein. The primal source of this phenomenon Dinst believes to be the placenta. Fibrinogen and fibrin ferment normally are formed in a small quantity, and immediately removed by the blood stream. In eclampsia these substances are apparently accumulated in the placenta, and finally produce eclampsia. An essential element in the production of eclampsia is the disturbance of the circulation in the mother whereby the stream of leukocytes disposing of these bodies is interfered with, and poisoning results.

A clinical paper upon the subject is contributed by Lytle.² He reports five cases treated by delivery and the use of narcotics. In most of them the fetus died or was delivered stillborn.

Carver and Fairbairn³ draw attention to symptoms produced by *hemorrhage into the pons* occurring during eclampsia. They observed deep coma and cyanosis as especially suggestive symptoms.

The unusual coincidence of *eclampsia and ectopic gestation* is reported by Costa.⁴ He has collected five cases from the literature, and adds one in which abdominal section was performed, and the ectopic pregnancy thus demonstrated. The patient recovered.

A case of *eclampsia accompanied by a monstrosity* is reported by Schönbeck.⁵ The patient was delivered during eclampsia by craniotomy and cranioclasia. The monstrosity was an ischiopagus parasiticus, and was delivered with difficulty by embryotomy.

THE TREATMENT OF ECLAMPSIA. An extensive paper upon eclampsia, its clinical history, statistics, and treatment is contributed by Seitz from Döderlein's clinic in Munich.⁶ Seitz draws attention to the pathological lesions recognized by all, and notes their resemblance to lesions produced by poisoning with corrosive sublimate and carbolic acid. He also calls attention to eclampsia without convulsions occurring once in

¹ Archiv f. Gynäkologie, 1908, Band lxxxvi, Heft 2.

² British Medical Journal, December 5, 1908.

³ Ibid., February 1, 1908.

⁴ Annali di Ostetricia e Ginecologia, 1908, No. 7.

⁵ Zentralblatt f. Gynäkologie, 1908, No. 21.

⁶ Archiv f. Gynäkologie, 1909, Band lxxxvii, Heft 1.

147 cases in the Munich clinic. Autopsy showed necrosis of the liver, meningeal hemorrhages, and parenchymatous degeneration of the heart and kidneys, with edema of the lungs. Others in reporting eclampsia without convulsions draw attention to the presence of cerebral hemorrhage in these cases. He also observed reflex eclampsia apparently produced by irritation of the lower centres of the spinal cord, successfully treated by lumbar anesthesia. He cites 8 cases where the injection of tropococain was successful in controlling convulsions; 4 of these patients died.

Cases of *post eclamptic psychoses* are cited from the literature, and Seitz adds two cases; one became permanently deranged and was transferred to the wards for the treatment of nervous diseases; the second recovered in three months, and ultimately had a normal pregnancy and puerperal period.

In all, he cites seven cases, and draws attention to the long pause between the first attacks in pregnancy and labor and the new outbreak of disturbance in the puerperal period. From two to seven days elapsed, during which the patients were more or less comatose. It is commonly thought that eclampsia ceases after the death of the fetus, but in most of these cases convulsions occurred as late as fourteen days after the child died. Some of these cases were especially severe from the number and violence of the convulsions and the development of post eclamptic psychoses. So far as the number of convulsions is concerned, the average is eight.

The mortality is greatest in cases having from sixteen to thirty convulsions—30 to 35 per cent. In patients having from one to fifteen convulsions, the mortality is markedly less. The mortality in patients having from thirty to seventy convulsions is 33 per cent., which is not greater than those having from sixteen to thirty convulsions.

Eclampsia may be divided into those cases where the poison seems diffused throughout the body, exerting its violence upon the heart, liver, and the lungs. In these patients many of them died without convulsions.

In the second variety, where the poison affects equally the nervous centres and the viscera, there was a greater or less number of convulsions.

In the third variety, where the cerebrum was most affected, the convulsions were most frequent and most violent.

As regards the frequency of eclampsia, Harig found 1 case in 3561 births; the mortality was 53.4 per cent. Hammerschlag, 1 case in 826 births, with a mortality of 25 per cent. Büttner, 1 case in 446 births, the mortality ranging from 21 to 44 per cent.

One cannot say that the more frequent eclampsia is the greater is the mortality. Löhlein estimates the general eclamptic mortality at 19.38 per cent.

There is no relation between the mortality from eclampsia and the mortality from all causes in a given clinic. It is interesting to observe

that eclampsia is least frequent in South Germany, Austria, and Hungary; next in the region of the Rhine and Switzerland. It occurs most often in middle and north Germany, especially in Berlin, Königsberg, and Leipsic. St. Petersburg has a relatively low percentage of eclampsia.

The important question as to the influence of delivery upon eclampsia is also considered. Statistics seem to show that convulsions cease after delivery in from 28 to 99 per cent. In general there seems to be an improvement in the convulsions, or their cessation after delivery. It is interesting to note that the improvement seems greater after cases delivered by operation than after those terminating spontaneously. Because the convulsions cease, it does not follow that the patients recover. A mortality from 14 to 26 per cent. is reported after the cessation of convulsions. In some clinics, cases delivered by operation are more severely ill than those with spontaneous labor. The statistics of the Charité, in Berlin, and the Munich Frauenklinik, show a mortality of 20.6 per cent. after convulsions ceased; 14.5 per cent. when the convulsions grew less severe; 36.4 per cent. when the convulsions were uninfluenced by delivery.

It is interesting to note that the mortality after delivery is greater than the general mortality of eclampsia. The number of convulsions is no accurate index of the severity of the eclamptic intoxication. If one were to decide whether the termination of labor by artificial means exerted a good influence in eclampsia, he must study each case upon its merits, and especially with reference to the degree of dilatation present when delivery was undertaken.

In the Munich clinic after artificial delivery, the mortality was 22.7 per cent. A study of the statistics indicates that conservative treatment has a higher mortality by 11 to 12 per cent. than has immediate and rapid delivery.

The mortality in rapid delivery is from 3 to 4 per cent. less than the general mortality of eclampsia. When the cervix is present, some form of vaginal Cesarean section is indicated; when the cervix is obliterated, but the os is not dilated, Dührssen's incision, or Bossi's dilator, may be employed.

Fry¹ makes a plea for prompt evacuation of the uterus in eclampsia. He reports 15 cases of eclampsia, and 1 of preëclamptic toxemia, with one maternal death. The patient who died was moribund when operated upon. In these cases vaginal Cesarean section was done in 12; manual dilatation and forceps in 2; multiple incisions, manual dilatation, and forceps in 1; and symphysiotomy and forceps in 1.

DECAPSULATION OF THE KIDNEYS FOR ECLAMPSIA. This treatment, advocated by the late Dr. Edebohls, was practiced unsuccessfully by Essen-Möller.² The kidneys were but little enlarged, and there was

¹ Journal of the American Medical Association, December 12, 1908.

² Zentralblatt f. Gynäkologie, 1908, No. 14.

no appreciable increase in the tension of the capsule. The patient was delivered by vaginal Cesarean section, but, coma developing afterward, decapsulation was unsuccessfully performed.

Esch¹ operated successfully upon a young woman whose convulsions occurred three days after normal labor. The right kidney was swollen and cyanotic, the capsule bulging freely when incised. In the left kidney there had been hemorrhages beneath the capsule.

Falgowski² reports a successful case of decapsulation in a patient who had given spontaneous birth to a child, and whose convulsions began thirteen hours after labor. Operation was done thirty-four hours after delivery. The kidneys were cyanotic and the kidney substance bulging into the wound after the capsule was incised.

Möhlmann,³ from the Olshausen clinic in Berlin, has contributed a paper upon the treatment of eclampsia. An effort is made to determine in each case whether the patient will be in greater danger from the continuance of eclampsia or from the operation proposed for her delivery. If she is in a hospital especially devoted to such cases, either Cesarean section, the use of Bossi's dilator, or incision of the cervix followed by forceps, may be selected. When, however, the case must be treated by a general practitioner, or where skilled operators and assistants cannot be obtained, vaginal Cesarean section can rarely be performed. Interference must not be practised upon mild symptoms without convulsions. Cases treated upon these lines showed a mortality of 15.4 per cent. The mortality among the children was 24.04 per cent., which compares favorably with that of other clinics.

Möhlmann quotes Esch's article upon this subject, in which he advises delivery by forceps or version when the conditions are favorable; and if the children be dead, by craniotomy. Immediate delivery is indicated where the mother is severely ill, with coma, fever, rapid pulse, and labored breathing. In coma without convulsions, with icterus and hemoglobin, and where the patient is prostrated by repeated convulsions, delivery should be promptly effected, if possible. In old primiparae, with marked albuminuria with kidney debris, delivery should be undertaken more promptly than in less favorable cases. In other words, if there is no sign of labor, and the patient's general condition is good, with little disturbance of the cerebrum, and pulse and respiration are good, immediate delivery is not indicated. Where the convulsions become more frequent and severe, with great disturbance of the general condition of the patient, or where a few very severe convulsions recur, delivery should be undertaken.

There is probably no point in obstetrics more difficult to determine than the indications for the expectant or operative treatment of eclampsia. I have seen recovery follow from all modern methods of treatment.

¹ Zentralblatt f. Gynäkologie, 1908, No. 9.

² Ibid.

³ Zeitschrift f. Geburtshülfe und Gynäkologie, 1908, Band lxxii, Heft 1.

In one most unfavorable case, the patient, a stout plethoric woman, was comatose, with high pulse tension and repeated convulsions; bleeding, followed by saline transfusion, lavage of the stomach and intestine, with the giving of calomel through the stomach tube, and hot packs, not only caused the eclampsia to cease, but enabled the woman to recover, go to full term, and give birth to a child which survived in good health. The mother's recovery was apparently perfect.

We know, furthermore, that eclampsia is a self-limited disease; that the effort of nature is to bring on the expulsion of the uterine contents and that forced delivery may add to the fibrin ferment of the blood and increase the tendency to convulsions and fatal coma. The physician may, if the patient's condition be good, treat her toxemia and watch for signs of labor, and when delivery can be effected by forceps or version without seriously wounding the cervix, it should be done. Rapid dilatation is dangerous, and delivery after rapid dilatation is often followed by considerable shock.

In many cases where the toxemia is virulent no treatment avails. The effort, however, should be made to rid the patient of the contents of the womb by that method which inflicts the least trauma and shock. In the absence of shortening of the cervix and dilatation, Cesarean section, abdominal or vaginal, should be chosen.

Status Epilepticus in a Parturient. Jardine¹ reports the case of a patient in her second pregnancy, admitted to the Glasgow Maternity Hospital with convulsions. The patient was not unconscious between the fits, but dozed; there was no edema, uterine contractions were absent, and the urine contained a trace only of albumin. Labor gradually developed, with the birth of a living male child spontaneously, followed by an increase in the frequency of the convulsions. The albumin disappeared entirely from the urine.

The treatment had no effect whatever. The patient was given sedatives, salt solution, and anesthesia, without influencing materially the convulsions. One ounce of cerebrospinal fluid was drawn off under considerable pressure, the fluid spurting out during the fits. The patient shortly afterward died suddenly.

The convulsions were eclamptic without cry, and the movements were bilateral. Shortly after admission they became unilateral, the right side being most often affected, the left side gradually remaining unaffected. The period of coma after the attacks was very short.

The child did well, autopsy upon the mother could not be obtained.

Placenta Prævia. PREMATURE SEPARATION OF THE PLACENTA. Under the title "*Ablatio Placentæ*," Holmes² publishes a paper in which he states that he has been able to collect 151 cases of absolutely concealed hemorrhage from placental separation. He estimates that hemor-

¹ Journal of Obstetrics and Gynecology of the British Empire, December, 1908.

² Journal of the American Medical Association, November 28, 1908.

rhages concealed or partially concealed from placental separation occur at least half as frequently as placenta prævia. This accident is much less frequent in primiparæ than in multiparæ, labor occurring at term in one-third of the cases.

As causes, he assigns direct violence, metritis, and endometritis especially associated with renal changes. The placenta itself may have been the subject of inflammation or of other pathological conditions. The condition resembles in its mechanism very closely that of typical abortion. The one reliable symptom is local and systemic evidence of hemorrhage. The blood is always retained in the uterus, and hence one cannot judge from the amount of vaginal hemorrhage how much blood has left the maternal vessels. The uterus is often distended unevenly, a large clot bulging the uterine wall over the placental site—the so-called accessory tumor. This sign may be elicited in about one-half of the cases in which it develops. The uterus may be tense or flaccid; and serous fluid may escape from the vagina, expressed from the retained uterine clot.

In separation of the normally situated placenta the uterus is painful and tenderness is usually most pronounced over the location of the largest clot. The patient is usually taken suddenly, with pain, nausea, violent fetal movements, the pain becoming intense, the patient feeling that the abdomen is distending, followed by signs of rapidly developing anemia. If the child is expelled, more or less dark clotted fluid blood accompanies it. The placenta shows evidence of separation by the presence of dark clots.

Placenta prævia and rupture of the uterus should be differentiated from separation of the normal placenta without especial difficulty. A bleeding fibroid in a non-pregnant uterus might counterfeit the accessory tumor of clot, and occasion difficulty in diagnosis.

Where the hemorrhage was entirely concealed the maternal mortality was 23 per cent.; where the hemorrhage was evident, 34.6 per cent. The general mortality was 32.2 per cent. for the mothers; 85.8 per cent. for the children.

Holmes has seen 9 severe cases, 2 of whom died, one from anemia, the other from eclampsia.

Immediate delivery gives a better chance of saving the mother than delay. Vaginal Cesarean section will be indicated in cases where the flow of blood does not obscure the obstetrician's vision. The hemorrhage incident to the operation might in a desperate case turn the scale against the patient. When full dilatation is secured, version, forceps, or craniotomy should be employed, the uterus being emptied as promptly as possible. As many of the children are dead, cranioclasia is indicated. Elastic bags and tampons are too slow in their action to be efficient. Patients with a rigid cervix taken to a hospital should be subjected to abdominal Cesarean section.

If the placenta does not follow the child, it should be immediately removed with the clots. The uterus and vagina should be tightly packed with antiseptic gauze, the fundus being firmly compressed by an assistant. Saline solution should be given as promptly as possible in double the estimated quantity of the blood lost. Adrenalin solution, ten drops to one or two quarts, may be added to the salt solution. In many cases small doses of ergot may be used to advantage.

In the study of placenta prævia at the present time the most interesting question for solution depends upon the choice of the method of treatment. The pathology, etiology, symptoms, and history of the condition have been thoroughly elaborated. With the perfection of surgical methods, a considerable number of obstetricians believe that cases of placenta prævia may be divided into two classes. (1) Those in which the cervix is greatly softened by the abnormal position of the placenta, so that it is readily dilated; and (2) where the obstetrician is obliged to follow the usual rule of giving the life of the mother precedence, while ignoring the life of the fetus.

In these cases older methods of treatment, as version, the use of elastic bags within the uterus, and the gauze tampon may be employed.

In the second class of cases are those in which the cervix is not much softened, but partially obliterated, not dilated and resisting. Not much blood has been lost as yet, and mother and child are in fair condition. The parents are willing to take a moderate risk for the life of the child.

In these cases delivery by incision, vaginal or abdominal, is indicated. The tendency at the present time is to bring all such cases into a hospital so soon as possible, and to subject them to surgical treatment in the hope of saving both mother and child.

Zweifel¹ reported before the Obstetrical Society of Leipsic 17 fatal cases of hemorrhage in placenta prævia, 16 of which were admitted to the clinic in a hopeless condition; the remaining patient lost 1600 c.c. of blood while under treatment in the clinic.

Zweifel urges the value of combined version in these cases without extraction. He believes this to be the most reliable method of controlling the hemorrhage, as it permits the obstetrician to give the mother the stimulating treatment which she requires before she experiences the shock of emptying the uterus with its accompanying hemorrhage. There is no question of the value of this procedure when dilatation permits version without difficulty. Many physicians, however, do not wait after the version, but proceed immediately to extraction. The uterus is suddenly emptied, fresh hemorrhage is excited, and salt solution is injected too late to combat the rapidly fatal anemia. Under antiseptic precautions after combined version the fetus may remain in the birth canal as a plug or tampon until the mother has rallied sufficiently to

¹ Zentralblatt f. Gynäkologie, 1908, No. 20.

develop uterine contractions. It will then be expelled, or may be removed with little or no hemorrhage and shock.

Treub¹ warns against Bonnaire's method in treating placenta prævia. This consists in dilatation and immediate extraction. In 71 cases the maternal mortality was 18.25 per cent.; the fetal mortality, 48 per cent. He reviews 10 fatal cases treated by this method, finding among them death from septic infection, from laceration extending into the parametrium, from peritonitis following laceration, and from acute anemia. He prefers the tampon, and in lateral placenta prævia, rupture of the membranes.

Meurer treated 52 cases of placenta prævia, 43 of them by rapid dilatation, with a general mortality of 4 mothers and 19 children. He had in some cases dangerous laceration of the cervix following rapid dilatation, and believes that this method should be practised in clinics only, and very cautiously.

The general mortality was 10 per cent. for the mothers and 67 per cent. the children.

Hannes² urges the value of the dilating bag placed within the amniotic cavity in the treatment of placenta prævia. In 119 cases there were 6 deaths, and a maternal mortality of 5 per cent. The best results of combined version show a mortality ranging from 6 to 10 per cent. Hannes' mortality from infection was 0.8 per cent., which is less than that given by combined version; 57.5 per cent. of the children were born living; by combined version but 16 per cent. of the children survived.

Abdominal Cesarean section in placenta prævia is urged by Krönig.³ He states the mortality by other methods of treatment to be from 6 to 10 per cent. of the mothers, and 60 to 80 per cent. of the children. He believes that abdominal section avoids dangerous laceration, carries its incision through tissues least likely to bleed and most accurately closed by suture, and that delivery by this method is attended with the least hemorrhage. In his 6 cases, 5 lost less than 300 c.c. of blood; 1 lost about 800 c.c. These 6 patients recovered in three weeks, and all of the children were living at birth. One prematurely born died before the mother left the hospital.

Sellheim⁴ vigorously condemns older methods of treatment in placenta prævia, and urges the value of his suprasymphyseal and extraperitoneal Cesarean section. He reports from the Tübingen clinic 15 cases treated by various methods; among these 8 were subjected to Cesarean section by his method. These 8 mothers recovered, and also the children. Sellheim believes that the blood lost is less, and that the danger to life for both mother and child is much less by extraperitoneal section than by combined version, the use of the tampon, or the elastic bag.

¹ Zentralblatt f. Gynäkologie, 1908, No. 43.

² *Ibid.*, No. 42.

³ *Ibid.*, No. 48.

⁴ *Ibid.*, No. 40.

In a case of placenta prævia complicated by a contracted pelvis Nijhoff¹ performed abdominal section successfully, mother and child recovering without complications.

The enthusiastic claims of those who urge delivery by section in placenta prævia have called forth a remonstrance from Martin, of Berlin, who directs attention to the value of older methods of treatment. This elicited a vigorous reply from Sellheim. The correspondence is published in the *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1909, Band xxix, Heft 1.

As explaining death in many cases of placenta prævia, Pankow² reports a fatal case treated by combined version. The placenta was attached to the isthmus of the uterus throughout its entire posterior wall. This circumstance made it impossible to control hemorrhage, even after the delivery of the child, as the placenta had been attached in such a way that there was no contracting portion of the uterus by which compression of the uterine sinuses could be effected. The removal of the placenta opened these sinuses and invited fatal hemorrhage. Pankow believes that under these circumstances delivery by abdominal and uterine section should be selected.

Caliri³ calls attention to the complications of placenta previa, and especially those resulting from infection. The situation of the placenta is such, and its open sinuses are so exposed to infection, that the treatment of this condition by vaginal manipulation must expose the mother to great danger.

Air embolism in placenta prævia is described by Esch.⁴ The case was a multipara with a normal pelvis, a living child, and dilatation permitting the entrance of one finger. There was slight hemorrhage, which ceased upon rest, but which became marked four days after admission to the hospital. Under chloroform narcosis combined version was performed and the feet readily brought down. There was little hemorrhage, but a free escape of amniotic liquid. Some time after version had been done the patient became suddenly blue in the face, and ceased to breathe, with a pulse small and rapid. The tongue was drawn out and a deep spasmodic respiratory effort was made; after this there were three or four shallow respirations. This condition lasted for about two minutes. Massage of the heart and artificial breathing were at once performed, with hypodermic injections of camphor and caffeine. As the mother's heart sounds could not be heard, the cervix was rapidly incised and the child delivered. It was apparently dead and could not be revived.

The autopsy revealed small fat drops in the blood of the pulmonary

¹ Zentralblatt f. Gynäkologie, 1908, No. 26.

² Monatsschrift f. Geburtshülfe und Gynäkologie, 1908, Band xxviii, Heft 5.

³ Annali di Ostetricia e Ginecologia, 1908, No. 1.

⁴ Zentralblatt f. Gynäkologie, 1908, No. 39.

artery, and in the right auricle a small bubble of air. There was a considerable amount of fat in the blood of the right ventricle. The foramen ovale was opened and air was found in the veins of the kidney, in the ovarian veins, the veins of the pia mater, and in the arteries at the base of the brain. The maternal death resulted from air embolism in the great vessels. The death of the child followed intracranial subdural bleeding and rupture of the tentorium cerebelli.

THE TREATMENT OF PLACENTA PRÆVIA BY THE USE OF CLAMPS. Henkel¹ reviews at some length the German literature of the treatment of placenta prævia, and states that, with his assistants, he has four times used clamps to check uterine hemorrhage. In 2 cases bleeding came from extensive lacerations in the cervix and lower portion of the uterus; and in 2 cases the bleeding was atonic only; 3 of these cases were placenta prævia, and in all cases the application of the clamps was promptly efficient. The clamps were allowed to remain twenty-four hours; the patient was catheterized, and no injury to the urethra or neck of the bladder found.

Henkel believes that the use of clamps tends greatly to prevent postpartum hemorrhage in placenta prævia.

LABOR.

Schatz² publishes the second of his papers upon the topic, "When Does Labor Occur?" He reaches no practical conclusion, but endeavors to establish a law of periodicity based upon the circulatory phenomena of each patient. He believes that suggestion and mental influence may act as the exciting cause of labor.

That labor may be expedited by the posture of the mother is a fact long familiar. Samuel³ reports the case of a primipara who had fever during labor, and who was about to be delivered by forceps, the patient being placed across her bed. Before her feet could be placed in chairs, a strong pain developed, while the lower extremities at both the hips and knees were strongly flexed. The birth of the head immediately followed. This posture assisted in the effect of the uterine contractions, and probably also enlarged somewhat the anteroposterior diameter of the pelvic outlet.

A case of precipitate labor is reported by Richter.⁴ The patient was a primipara who endeavored to expedite labor by walking about. Sudden expulsive pains developed, the umbilical cord ruptured, and the child was expelled upon the floor. There was no hemorrhage from the cord, but the mother had considerable bleeding lasting but a few moments. The placenta remained in the uterus until two hours afterward, when it was removed in the hospital.

¹ Archiv f. Gynäkologie, 1908, Band lxxxvi, Heft 3.

³ Zentralblatt f. Gynäkologie, 1908, No. 8.

² Ibid.

⁴ Ibid., No. 15.

On examining the membranes, there was an extensive tear through which the child had escaped.

In the discussion Leopold stated that he had very seldom seen inversion of the uterus follow precipitate birth.

Difficult Labor and the Retraction Ring. Andrews and Maxwell¹ report the case of a patient, aged thirty-eight years, who had had miscarriages and stillbirths, but had never borne a living child.

Counting from the last menstruation, the patient was over forty-four weeks in pregnancy before labor began. She first came under observation when she was said to have been in labor two and a half days. The mother's pulse was 90, the pains were good, and the uterus was not tender. The child presented normally, the heart beat could not be heard, there was full dilatation, the head was soft, and there was a foul discharge from the uterus. The head was bulging so much into the brim of the pelvis that the conjugata vera could not be made. Delivery was attempted unsuccessfully by extraction by forceps and craniotomy. The effort to deliver brought away a portion of the face and walls of the cranium; portions of the arms were also removed in a further effort to deliver. Version also failed, as did the effort to extract the skull by pulling with a hook fixed in its base. The effort to remove the fetus by embryotomy proved unsatisfactory, and tonic contraction of the uterus developed with a deep furrow on its anterior surface. All efforts at removing the fetus failed, as it seemed to be held with a tetanic uterine grip.

Abdominal panhysterectomy was then performed as rapidly as possible. The patient survived twenty-eight hours.

Frozen sections were made of the uterus with the fetal remains in situ. The fetal remains were then removed and found to weigh six and a half pounds. This was after the removal of the head, some cervical vertebræ, the thoracic viscera, most of the abdominal contents, both arms, and one leg.

On examining the uterus, Bandl's or Braune's ring could be seen very markedly developed. This had evidently been an essential factor in preventing vaginal delivery.

The Management of Labor in a Minor Degree of Pelvic Contraction, with a Report of Eighteen Cæsarean Sections. Fry² found contracted pelvis in 532 cases; among white women, in 131; negroes, 401; in white women, 53 per cent. of pelves having external normal diameters, and 45 per cent. among negro women having external normal diameters. Among the whites there were 3 per cent. having external pelvic diameters above the normal. Of justominor pelves there were 25 per cent. among the whites, and 49 per cent. among the negroes. The simple flat pelvis was found in 20 per cent. among the whites, and 5 per cent. among the

¹ Journal of Obstetrics and Gynecology of the British Empire, April, 1908.

² American Journal of the Medical Sciences, May, 1908.

negroes. This gives 45 per cent. of contracted pelves among the whites, and 54 per cent. of contracted pelves among the negroes.

The pelvis should be measured in every case, as pelvimetry affords valuable information to guide the obstetrician in treatment.

In minor degrees of pelvic contraction discovered in the thirty-second week of pregnancy, if the induction of labor is to be undertaken the patient should be examined weekly to see that the head can be made to enter the inlet of the pelvis. If this can be accomplished by the thirty-sixth or thirty-seventh week, labor may be induced. If it does not succeed up to that time, the case is thought not to be a proper one for the induction of premature labor. The patient may then go to term, and the test of labor awaited. If engagement and descent does not occur, elective Cesarean section is indicated. Where moulding and engagement occur, and artificial assistance must be given, the patient should be placed in Walcher's position and forceps applied. Should slight traction, under aseptic precautions, fail, and the conditions are favorable, section may then be done. If the life of the child has been jeopardized, or if the child is dead, craniotomy is indicated. If mother and child are in good condition the obstetrician may elect symphysiotomy or pubiotomy rather than section.

When disproportion between the fetal head and the mother's pelvis is decided, and the head cannot be forced into the inlet by pressure under chloroform, Cesarean section should be done shortly before full term. Sufficient dilatation must be secured, preferably by labor, to permit free drainage.

Fry believes that in minor degrees of pelvic contraction, one should delay until labor has demonstrated the resources of Nature. Moulding and descent failing after from two to six hours of labor, forceps or version should be declined and elective Cesarean section should be done. If engagement has occurred, a careful application of axis traction in Walcher's position may be made, but if unsuccessful, Cesarean section should follow.

The indications for Cesarean section should be extended to cases in which the true conjugate is 8.5 cm. (3.4 in.) or more for just minor pelves, and 9 cm. (3.6 in.) for the simple contracted pelves. Where the head cannot be forced through the inlet under chloroform, section may be done regardless of the degree of contraction.

Fry tabulates 18 cases of Cesarean section, with a maternal mortality of 1 and a fetal mortality of 3. Two of these infants were not viable: 1 was delivered at the seventh month for fibroid blocking the pelvis, and 1 at six and a half months for central placenta prævia. The indications for Cesarean section were absolute in 8 cases.

The death of the mother in the fatal case occurred on the third day from twisting of the intestine and distention of the stomach. The peritoneum and uterine incision were free from infection.

Fry believes that symphysiotomy and pubiotomy remain useful expedients when one is forced to resort to one or the other in preference to craniotomy upon the living child. In a patient exhausted by prolonged labor from manipulation and the use of forceps, when the parts are contused and lacerated and the patient probably infected, he would choose one of these operations.

Craniotomy may be performed after prolonged labor, or failure of version or forceps, the infant being dead or dying. The diminution in the true conjugate must not be beyond the limits of an absolute indication for Cesarean section.

Labor Complicated by Vaginal Fixation of the Uterus. Schroeder¹ has observed five pregnancies in patients who had been operated upon for prolapse of the uterus. Some of these cases had vaginal fixation, and others suture of the peritoneum. One of these aborted; the remaining four went to full term. Two of these were spontaneously delivered without prolonged labor, but required expression of the placenta for threatened postpartum hemorrhage. The third patient, examined at the eighth month, showed the uterus developing normally with the cervix in normal position, but the child in a transverse position. The child was delivered by version and extraction, the mother making a good recovery.

Schroeder also reports the case of a patient operated upon for retroversion and endometritis, upon whom curetting, anterior and posterior colporrhaphy, amputation of the cervix, and vaginal fixation had been performed. Two silk stitches were removed from the anterior uterine wall, inserted to secure its union with the vaginal wall.

The patient again came into the hospital in the tenth month of pregnancy. The head of the child was movable above the pelvic brim, the cervix was directed backward, remaining at the level of the promontory of the sacrum. Under labor pains the cervix was drawn up beyond reach.

Examination under anesthesia showed the cervix above the promontory upon the left side partially dilated, and the head movable above the cervix. The hand was introduced above the internal os and the parts dilated, when the head and cervix descended into the pelvic cavity, the os being partly dilated. This manipulation ruptured the membranes, and amniotic liquid containing meconium escaped. The cervix was then incised in four directions, and the child delivered by forceps. The placenta was expressed, when hemorrhage ceased. The puerperal period was somewhat delayed by prolonged involution, but mother and child made good recoveries.

The Management of the Third Stage of Labor. Winckel² believes that in 76 per cent. of all cases the placenta is expelled by inversion into the

¹ Zentralblatt f. Gynäkologie, 1908, No. 34.

² Deutsche med. Woch., January 9, 1908.

membranes through the action of a clot which forms behind the placenta. In from 15 to 20 per cent. of cases the lower edge of the placenta is first separated and its uterine surface is then apparent.

In but 3 or 4 per cent. of all cases is the mother's expulsive force not sufficient to complete the third stage without interference. Winckel gives his experience in the discharge of the placenta in 968 cases. In 569 complete expulsion occurred within half an hour; in 262 in one hour; in 137 within two hours. The third stage is spontaneously accomplished within an hour in 86 per cent. of all cases. In 8097 cases of labor but 14.86 per cent. had some elevation of temperature. The septic mortality was 0.14 per cent.

His method of treatment consists in conducting the expulsion of the child slowly without hurrying the delivery of the body. The patient is then turned slowly upon her back and the contraction of the uterus observed by placing the hand upon the fundus. The external parts are then cleansed and a suitable receptacle placed beneath the patient. The cord is ligated near the vulva, the end remaining in the receptacle. The hand is then removed, the patient's lower extremities are flexed, and her body is covered.

When the patient feels the discharge of blood or pressure against the vulva, she is told to bear down. Inspection is made every ten minutes to observe hemorrhage and uterine contraction. On its expulsion the placenta is carefully examined to detect missing portions from the uterine surface and membranes. If there is reason to fear relaxation, ergot is given after the expulsion of the child. If two hours pass without delivery of the placenta, expression is employed. Should this fail, and if there has been considerable hemorrhage, the patient is anesthetized and expression again tried. Only when this is not successful the placenta is removed under aseptic precautions by the introduction of the hand.

Early Getting up in Puerperal Patients. Fromme¹ reviews various arguments upon this subject, and includes cases of laparotomy in his consideration. He finds that among various investigators indications for early getting up in the puerperal period differ so widely that a unanimous decision is impossible.

Martin allowed 100 patients to get up in from fifteen to twenty-four hours after labor, and during the next seven days to remain out of bed two hours in the forenoon and afternoon. The morbidity among these patients was 13 per cent., while among the same number who remained in the recumbent posture the morbidity was 18.5 per cent.

There was no case of embolism or alteration in the position of the uterus among these patients. Observers seem to agree that it is of great advantage in these cases for the patients to have spontaneous emptying of the bowels and bladder, and that the strength of the abdomi-

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1908, Band lxxiii, Heft 2.

nal muscles and those of the pelvic floor is much increased by early getting up. The mental condition of these patients seems to be better than that of those who remain longer in bed. The results did not show that the movement of these patients exposed them especially to thrombosis.

Whenever there is the slightest septic element about a patient it is dangerous for them to get up early. Marked anemia is also a contraindication, as is any affection of the lungs, especially inspiration or hypostatic pneumonia. In allowing patients to get up early, they are not to move about or undertake work. They are to remain quietly in the newly acquired position of the body. If the pulse rises and the temperature falls, or other unfavorable symptoms develop, the patient must remain in bed until these symptoms disappear. The physician's control of the patient must not be relaxed, nor the time of observation shortened because the patient gets up early.

OBSTETRIC SURGERY.

The Results of Forceps Delivery for Mother and Child. Gans¹ reports the results of forceps operations in 4636 patients treated in the clinic at Königsberg, and 3640 patients delivered in the Polyclinic.

Among the patients in the clinic, forceps operations were performed in 157, and among the Polyclinic patients in 405. Among these cases there were thirty-two twin births. The percentage among in-patients averaged 3.38; in out-patients the percentage was 11.12. This arose from the fact that many out-patients had been under the care of midwives, and labor had not proceeded as successfully as among the patients in the hospital.

Comparison of the results in former years, and also the results in other clinics, shows that at the present time the indications for the use of forceps are different from those formerly prevailing. The field for forceps operations has become considerably narrowed.

As in other hospitals, the percentage of forceps operations is much greater among primiparæ than in multiparæ, being 80.89 per cent. in the former, and 19.11 per cent. in the latter. This may be accounted for by the greater resistance of the birth canal and the prolongation of the second stage of labor, which exposes mother and child to danger. In the out-patient service the number of multipara coming under observation is much greater, and so the percentage of operations among such patients is increased.

Forceps operations among primiparæ are most frequent between the twenty-first and twenty-fifth years of age, because most births occur in

¹ Monatsschrift f. Geburtshülfe und Gynäkologie, 1908, Band xxvii, Heft 4.

primiparæ between these years. Among multiparæ in the hospital, the most frequent operation was performed between the years of twenty-six and thirty; and in out-patient service between the thirty-sixth and fortieth years. In both in- and out-patient service, forceps operations are most frequent in primiparæ after the thirtieth year of age.

In discussing the indications for the use of forceps failure in the mother's expulsive forces are considered by some an adequate reason. Others agree with Zweifel that weak labor pains are not dangerous so long as the child remains within the uterus, and that delivery by forceps under these circumstances predisposes to relaxation and hemorrhage.

The use of the confinement stool, by which the patient assumes the sitting posture, is thought by some more favorable than the employment of forceps. In the Königsberg clinic failure of expulsive efforts during the period of expulsion is considered abundant indication for the termination of labor, because it is believed that prolonged labor is dangerous to mother and child. When the os is fully dilated, the head presenting normally, and the pelvis sufficiently roomy, if progress does not occur in marked degree within two hours, labor is terminated. Before this decision is reached, efforts are made to increase the expulsive forces by hot and cold applications to the abdomen, hot vaginal douches, the use of elastic bags, and other established methods. In eclampsia the forceps is applied in behalf of the mother, and when asphyxia threatens the child, the operation is done in the interests of the infant. In the maternal interests, forceps operations were performed in 62.42 per cent. of cases, and in the out-patient service in 64.19 per cent. In the hospital, in the interests of the child, the operation was done in 37.58 per cent., and in the out-patient service in 35.8 per cent.—in all, the forceps were used for the mothers in 63.7 per cent., and for the children in 36.29 per cent.

Among the maternal indications failure of expulsive effort was the cause in 28.1 per cent.; fever during labor in 21.17 per cent.; eclampsia in 11.2 per cent.; threatened uterine rupture in 1.06 per cent.; cardiac disease in 71.01 per cent.; tuberculosis in 0.5 per cent.; hemorrhage in 0.5 per cent.; and nephritis in 0.3 per cent.

Asphyxia was the principal indication on the side of the child. Labor was promptly terminated for a temperature of 101° or 102°; and in eclamptic cases convulsions ceased in more than one-half of the patients after delivery.

The prognosis of the operation is of especial interest. The mortality for the mothers was 3.02 per cent.—or, in all, 17, 4 in out-patient practice and 13 in the wards of the hospital; 11 of these patients died from eclampsia and its complications, 2 died of tuberculosis, and 1 of infarct of the lung on the ninth day after delivery. The operation itself could scarcely be said to have caused death in the mother in any of these cases. In addition to the 14, there was one case of rupture of the uterus in a

multipara in whom the cervix was very resisting. Labor was very slow, and hot vaginal douches were given to soften the cervix. The patient was finally delivered without difficulty by forceps. Half an hour afterward an effort to express the placenta failed, but the uterus seemed well contracted and there was no hemorrhage. Some time after she showed signs of shock and anemia, and the introduction of the hand into the uterus to remove the placenta detected rupture upon the anterior wall. The placenta was readily removed, and the patient was prepared for vaginal removal of the uterus. Death occurred during preparation. Autopsy showed a large quantity of clotted blood in the abdomen with rupture of the uterus.

In a second case the patient was delivered by forceps because her pulse and temperature indicated infection. Hemorrhage followed, which ceased upon expressing the placenta. The child was revived, but died an hour after labor. The patient developed rapid septic infection, which proved fatal. An autopsy could not be obtained.

In the third case labor had lasted sixty-four hours, when the patient was delivered by forceps. In the delivery a portion of the cervix was included between the forceps and the head, and the delivery was difficult. A tear was found opening the cervix and vaginal canal. There was no wound of the peritoneum. Hemorrhage was absent and lacerations were immediately repaired. The patient developed peritonitis and died shortly afterward.

The lacerations sustained in the use of forceps must have favored the development of infection. Operation in this series of cases was followed by one death from rupture of the uterus, and two from septic infection. If but the last case is ascribed to the use of forceps, the mortality of the operation is thought to be 0.18 per cent.

In estimating the morbidity, a temperature above 100.5° is thought to be abnormal. The morbidity percentage was 21; 3.82 per cent. of these cases were those of severe septic infection; 2 were cases of thrombosis.

In estimating the frequency of lacerations in forceps cases, episiotomy was performed in 24.73 per cent.; 51.06 per cent. of these cases sustained lacerations during operation. There were 16.9 per cent. of lacerations of the perineum of considerable extent. The cervix was incised in 5.65 per cent., and the cervix drawn to the vaginal junction in 1.95 per cent.; in 0.71 per cent. there were lacerations of the pelvic floor and perineum and vagina as well—all of a severe nature. In 0.17 per cent. there was laceration of the clitoris and perforation of the vagina.

In cases of incision of the cervix there was no hemorrhage, and no stitches were taken. In one case of deep incision of the cervix during forceps delivery the incision tore into the parametrium followed by severe hemorrhage, which was checked by the use of a tampon.

The cervix was torn eleven times to a considerable extent during forceps

delivery. Lacerations of the pelvic floor and perineum of considerable extent were immediately closed by catgut with primary union in the greater portion of the cases.

In four cases there was profuse hemorrhage after forceps delivery requiring the removal of the placenta. One was a case of tuberculosis, one of eclampsia, and two of fever developing during labor. In another case there was hemorrhage following prolonged labor and failure of expulsion. In all, the placenta was removed to check hemorrhage in 0.88 of 1 per cent., following forceps delivery. In 135 cases the amount of blood lost after operation was found to average 548 grams. This corresponds favorably with Winckel's estimate that 500 grams is the least hemorrhage occurring normally after labor.

Injuries to the child delivered by forceps comprise bruising of the cranium, depression of the cranial bones, excoriation, edema, wounding of the skin, suffusion with blood, and swelling of bruised tissue followed by atrophy. In 2 cases large hematomata developed upon the cheeks; in one near the stylomastoid foramen; and in one near the left nares. These injuries disappeared soon after labor, leaving no permanent results. In 40 cases there was facial paralysis—fifteen times upon the right, twenty-five times upon the left side, which disappeared before the child left the hospital. In 4 cases fatal injuries occurred; in one, by subdural hematoma; in 2 through intracranial hemorrhage; and in one through multiple fracture of the skull. These children were born deeply asphyxiated, dying shortly after.

In the case of a primipara, aged twenty-two years, with normal pelvis, forceps delivery lasted thirty minutes. The child was 52 cm. (20.8 in.) long, weighing 3050 grams (6 lbs.), with a maximum head diameter of 13.4 cm. (5.36 in.) and a biparietal diameter of 8 cm. (3.2 in.). Although the child was born with feeble heart beat, it could not be made to breathe.

Upon autopsy, a spoon-shaped depression in the cranium was evident, with fracture of the cranial bones and intracranial hemorrhage. In two cases fracture of the clavicle occurred, in one during the extraction of the child by the shoulders, and in the other during the efforts to establish respiration.

The mortality among the children so delivered was 12.45 per cent. If all cases are excluded where death might have resulted for causes other than operation, the operation may still be charged with the mortality among the children of 10.32 per cent. In some of these cases the children probably died of asphyxiation developed before the forceps was applied.

Among the 562 operations the pelvis was abnormal in 4.4 per cent., or 25; 15 of these were flat pelvises, 6 just minor, 1 kyphotic, 2 obliquely contracted, and 1 was contracted at the pelvic outlet. In no case was the forceps operation chosen because the pelvis was contracted. In 3

of these a contraction ring developed in the uterus; in 7 the mothers' temperature rose before operation; in 7 the child was threatened by asphyxia; and in 4 expulsive efforts ceased three times because of eclampsia, and once because of pronounced nephritis with edema. The mortality among the children in these cases was 20 per cent. The smallest true conjugate among these patients was 9 cm. (3.6 in.). The patient was delivered by forceps because asphyxia threatened, the operation being a high application. The child had right-sided facial paralysis with hematoma, but finally recovered.

Among the 25 cases delivered by forceps, all showed some marks of pressure; 3 had facial paralysis, and one had a large hematoma over the eye. One child that died had a subdural hematoma. In 18 of these cases the application was a high one.

It is of especial interest to note the results of the operation when the forceps was applied above the pelvic brim. There were 33 of these cases, or 5.87 per cent. of all. In 12 an effort was made to press the head into the brim before the application of forceps. The indications were eclampsia in 11, threatened uterine rupture in 2, fever during labor in 15 and asphyxia of the child in 5. One of these patients had fever in the puerperal period; the rest had an undisturbed puerperium. There were lacerations in 7 cases, and in 7 incision was practised, and episiotomy in 9. Three of the mothers died from eclampsia. The mortality among the children was $33\frac{1}{3}$ per cent. Two of the children were stillborn.

The mortality and morbidity among the children with the high forceps application in abnormal pelves was much higher than where the complications with abnormal pelves were absent.

It was necessary to complete the dilatation of the cervix by artificial means in 44 cases. Elastic bags were employed in one, Bossi's dilator in 10, incision of the cervix in 33.

The presentation of the child was, in the first position of the vertex, in 343; the second position in 216; the first brow in 1; the second brow in 5; and a second position with face presentation in 2.

Chloroform was the anesthetic employed, with the exception of a few cases where ether was used. Antiseptic precautions were observed and the patient was delivered in the dorsal posture. A Naegele forceps was used in most cases. In 9, where the high forceps operation was done, Simpson's instrument with axis traction attachment was employed. In one of these cases axis traction forceps failed and the Naegele forceps succeeded. In another the axis traction forceps was tried three times, and failing, Naegele's instrument succeeded.

An effort was made to observe the permanent results of forceps delivery among children and mothers. In 70 cases the growth of the child could be traced. All but one had developed well. This child, a girl, aged five years, had been delivered by an easy operation and

sustained no injury at the time of birth. Another child had contraction of the sternocleidomastoid muscle, producing an abnormal position of the head. This child was delivered by an easy application of the forceps at the pelvic outlet. It seems probable that some injury to the muscle developed during the passage of the child through the birth canal.

In 4 children well developed, one aged nine years, one four years, and two aged five years, there was a history of convulsions. One of these was a case of epilepsy; the other three were epileptic in character. The delivery of these children had been difficult, and no apparent injury was present after birth, but the possibility that a forceps delivery produced some intracranial depression resulting in epilepsy cannot be denied. Two children had scars upon the left side of the frontal bone, produced by the forceps blades. In 61 cases, the mothers reported that the children had grown normally and developed well in body and mind. One mother, whose boy was nine years old, stated that her child was deficient in mental development. There were 49 deaths reported among the children so delivered: from enteritis, 15; pneumonia, 8; unknown causes, 5; convulsions, 5; pulmonary catarrh, 4; accidents, 2; tuberculosis and meningitis, 4; inanition, 1; erysipelas, 1; congenital heart lesion, 1; diphtheria, 1; scarlet fever, 1; and whooping cough, 1.

Most of these deaths occurred between the first and sixth months; eight cases between the first and third weeks; and also in the second year of life.

The final results for the mothers could be obtained by examination in 21 patients. These were primiparous patients at the time of delivery; in 9 of these there was shortening of the perineum; in 4, scars in the vagina, causing no inconvenience; in 4, enlargement of the cervix; and in 3, bilateral laceration. There was slight prolapse of the anterior vaginal wall in 4; in 1 complicated by shortening of the perineum. One case of complete laceration of the pelvic floor and perineum was immediately repaired, but did not heal. The patient was again five months pregnant, and after the expiration of the present pregnancy would consent to operation. Sixty-two patients reported themselves as being well, and having no bad result from the forceps operation; 3 women died from infectious diseases; in 75 cases there was a report of subsequent pregnancy.

More than one-third of the patients had not again become pregnant among the primiparæ; 5 multiparæ with whom from two to seven years elapsed since labor had not again become pregnant; 43 patients had repeated pregnancy; 23 had one pregnancy; and 20 more than one.

The reason why so many patients delivered by forceps did not again become pregnant is not explained. Upon examination, before discharge from the hospital, no condition was found which could have made conception impossible.

The writer concludes this minute study of the application of forceps

with the statement that the general results of the operation are much better than those given by some other writers. He believes, however, that from the most favorable standpoint the operation is not to be undertaken except by skilled persons, and with trained assistants. Under these circumstances the operation saves the lives of mothers and children; while if improperly performed, and without proper facilities and assistance, it remains in its results one of the most dangerous of obstetric procedures.

I have quoted this paper at length because I consider it especially timely. At present the tendency is so much toward delivery by abdominal and vaginal section that there is danger lest the merits of other methods be neglected. At the same time, the fact is appreciated that the use of forceps judged by modern surgical standards is not a simple operation; that it is to be conducted by surgical methods; and that the field for the use of forceps has its distinct limitations. When the head presents and spontaneous birth does not occur, it is no longer justifiable to apply forceps and make traction. The possibility of vaginal delivery without mortality and morbidity to mother and child must first be considered.

The results given in Gans' paper show the use of forceps under its most favorable light in the hands of experts with thorough modern technique. The percentage of mortality and morbidity among mothers and children is sufficiently great to emphasize his conclusion that forceps operation is not to be undertaken except by skilled persons, and with trained assistants. If improperly performed, it remains in its results one of the most dangerous of obstetric procedures.

Zangemeister¹ reports an unusual and interesting complication attending the use of forceps. The patient was in her second labor at the age of forty-four years. The pelvis was normal, the amniotic liquid escaped prematurely, the fetal heart sounds became irregular, and delivery was required. The birth canal was unusually resisting, because the patient had had a plastic operation to repair injuries in a former labor. The position was the second, the smaller fontanelle being on the right side posteriorly. Double episiotomy was performed under anesthesia and the forceps applied transversely in the pelvis. Under strong traction the fontanelle rotated posteriorly and a brow presentation developed. The effort to deliver the occiput by causing strong flexion was hindered by the scar tissue in the pelvic floor. In the effort to dilate the pelvic floor the nose of the child appeared beneath the pubis, and delivery was effected by traction upon the mouth and the gradual delivery of the chin. Mother and child recovered.

Ziegenspeck² reports a case of face presentation in a multipara, with second position. The child was very large, and the mother had a pendulous abdomen, which hindered the descent of the head and favored

¹ Zentralblatt f. Gynäkologie, 1908, No. 20.

² Ibid., No. 24.

the development of face presentation. As version seemed contra-indicated, the forceps was applied on the sides of the head at the brim of the pelvis, and the head brought transversely into the pelvic cavity. The forceps was first applied over the face and occiput. The instrument was then removed and reapplied, the left blade anterior. The head was then gradually delivered in face presentation. Mother and child made uninterrupted recoveries.

Ziegenspeck believes that in these cases the simple forceps is often better than the complicated axis traction instrument. He believes that traction can be made in the axis of the pelvis by the use of one hand as a fulcrum, the other making traction with leverage with the blades. As the head descends the direction of traction can be more easily altered, and the pelvic floor better guarded with the simple instrument.

In my experience, the use of Poulet's tapes fitted to the Simpson forceps has given the best results. The Simpson forceps is made heavier than usual, and the tapes are passed through the cephalic portion of the blades at their middle. Traction is thereby applied to the middle of the fetal head, and much better flexion or extension is thus obtained. In complicated forceps delivery I have found especial advantage in this simple and efficient instrument.

Extraction of the Breech in Breech Presentation. Eisenstein¹ describes and illustrates forceps which he has constructed for application to the breech. They resemble two blunt hooks with a movable compressing screw and handles large enough to afford a firm grasp. They may be applied over the crests of the ilia without doing serious damage to the child. Traction is then made in the axis of the pelvis. The blades are sufficiently enlarged not to cut into the fetal tissues.

He reports the case of a multipara who had strong labor pains, developing a contraction ring while the breech of the child which presented did not descend. One blade of his forceps was introduced posteriorly, the other anteriorly, while a third was added after the other two had been closed. These blades grasped the fetus by its pelvis at the brim, and with the instrument strong contractions delivered the breech and the body to the umbilicus. The forceps was removed readily and the child delivered. The only mark of the instrument was slight redness upon the right ischium.

The Technique of Cranioclasia and Extraction. Jolly² reports three cases of cranioclasia from Olshausen's clinic in Berlin, and calls attention to the technique of the operation.

Perforation of the presenting head with scissors or trephine rarely offers especial difficulties, but cranioclasia and extraction may present very great obstacles. The cranioclast may bring away from the head pieces of bone without delivering the skull, requiring repeated applica-

¹ Zentralblatt f. Gynäkologie, 1909, No. 3.

² Ibid., 1908, No. 51.

tion. If the head is delivered, large shoulders in contracted pelves may occasion much difficulty.

To prevent the slipping of the cranioclast the effort should be made to apply the instrument over the occipital bone. The blades of the cranioclast should be pushed as far as possible upon the base of the fetal head. The introduction of the internal blade through the foramen magnum is of advantage. In cases of brow or face presentation, the cranioclast should be applied to the face, as there a firm hold can often be obtained. In some cases the frontal bone may be torn away, if delivery be difficult. To assist in the descent of the head a pair of strong tenaculum forceps should grasp the skull near the opening of the perforation, and during the application of the cranioclast the head should be drawn strongly downward. The tenaculum forceps may remain during extraction of the head, and are sometimes of assistance.

In making traction it is not always enough to follow the simple rule of pulling strongly downward and backward. If the disproportion between the head and the pelvis is great, the cranioclast may tear away from the cranium, although the instrument has been carefully applied.

Under these circumstances, Olshausen recommends rotating the head with the cranioclast during traction. Rotation should be performed in the direction in which it is most easily accomplished. The perforated head thus takes the form of an irregular wedge, and may gradually be brought through the pelvis.

Where the shoulders delay in spite of strong traction it is sometimes necessary to introduce the hand and bring down an arm. Cleidotomy, originally recommended by Phenomenoff, is advised for this complication. It is not an altogether easy procedure, but gives good results when it is performed.

Jolly has had good results when the shoulders delayed by the use of the blunt hook applied to the posterior shoulder. The hook is passed into the posterior axilla and used in the same manner that it would be upon the brim of the pelvis in the extraction of the breech.

Jolly's first case was that of a multipara, during whose labor an attempt at delivery had been made by a physician, who brought down the right foot of the child but was unable to complete the version. On admission to the hospital there was fever, the abdomen was rigid and sensitive, the contraction ring in the uterus was present and there was edema of the vulva. Heart sounds could not be heard. The right foot was in the vagina, dilatation was complete, and the head was at the pelvic brim, in second position. Delivery by the cranioclast was attempted, but the instrument brought away pieces of bone without extracting the head. By the use of a strong tenaculum forceps and the cranioclast applied at the base of the skull, the head was delivered. The shoulders were large, and remained so high in the pelvis that the axilla could not be reached. The clavicles could not be severed with safety because of

their high position and the danger of wounding the mother. Braune's decapitation hook was then inserted into the axilla, and the child delivered without great difficulty. The fetus weighed 8.3 pounds, was 57 cm. (23 inches) long, and well nourished. The mother made a good recovery.

The second case was complicated by prolapse of the cord, resulting in the death of the child. The head was movable at the pelvic brim and in first position. The pelvis was slightly flattened.

After perforation an attempt at delivery with the cranioclast resulted in tearing away some of the bones of the cranium. A strong tenaculum forceps was then fastened upon the face and the cranioclast applied as high on the face as possible. Traction and rotation then succeeded in delivering the head. In spite of strong traction, the shoulders did not descend when the posterior left clavicle was severed. The right clavicle could not be reached. The shoulders still remained immovable, when the introduction of the decapitation hook proved successful in delivery. The child weighed $9\frac{3}{4}$ pounds, was 65 cm. (26 inches) long, and had a shoulder circumference of 58 cm. (23.2 inches). The puerperal period was normal.

The mother in the third case had a slightly flattened pelvis and the child's head was very large. During labor eclampsia developed with a single convulsion. The mother's pulse was small and feeble and very frequent. The heart was enlarged and myocarditis was evidently present. Labor had then endured for two days, and the serious condition of the mother made prompt delivery imperative. The high application of the forceps failed, and fetal heart sounds ceased. The head was delivered by perforation and craniotomy, but the shoulders failed to descend. The left clavicle was then severed and it was necessary to use the decapitation hook in the axilla to bring down the body. Even the delivery of the fetal pelvis was difficult. The mother recovered.

Jolly believes that cleidotomy is only efficient in cases where disproportion between mother and child is slight. After the clavicle is severed the shoulder sinks toward the back, and the child is more movable and can be pressed against the body more easily. The shoulder circumference of the fetus is very little lessened. The maximum diameter during the entrance of the shoulders through the pelvic brim is not essentially altered by cleidotomy. The angle, however, between the shoulder and the body of the fetus can be altered, and one shoulder can be drawn toward the head while the other can be pressed downward. This alters the contour of the fetal body and permits the termination of impaction. One shoulder may first be brought into the pelvis and then the other.

My experience has been similar to that of Jolly in the value of Braune's hook for the extraction of the dead fetus. I have employed it in the axilla and also over the brim of the pelvis with good results.

As the fetus is dead, it is best to sink the hook deeply into the body of the child; and in the axilla there is no objection to carrying it through

the axilla into the thorax. At the pelvic brim it may be carried deeply into the iliac fossa. The stem of the hook is so small that it takes no room in the vagina otherwise required for manipulation. It may be used with the cranioclast with the best result.

The History of Podalic Version. Ingerslev¹ calls attention to a compilation of ancient and medieval knowledge, made by Rösslin, and first translated into English by Richard Jonas in 1540.

In this work a description is given of methods for assisting the mother in delayed labor, showing that Soranos employed podalic version in the case of a living child. When the position of the child was unfavorable, the hand was anointed with a suitable ointment, introduced within the womb, and if the fetal hands and arms were presenting with the head, they were dislodged and carried out of the way. If the hands were above the head, and the lower extremities not flexed, the feet were brought down and the child extracted. This must be done with a quiet, steady hand, anointing the genital canal frequently, when many children may be delivered alive.

Aëtios was the last author to plainly describe podalic version, and with him the knowledge of this obstetric operation disappeared for one thousand years, until Paré revived it.

The Mortality of Various Methods of Delivery in Contracted Pelvis. In Bürger's recent book upon the *Management of Labor in Contracted Pelvis*, Wien, 1908, the mortality following the various methods of delivery in contracted pelvis in 5288 cases is given. The use of forceps is credited with no direct maternal mortality, with 12 per cent. puerperal morbidity, and 11.6 per cent. fetal mortality. Version had 0.5 per cent. maternal mortality, 0.9 per cent. puerperal morbidity, and 71.4 per cent. fetal mortality. Extraction in breech presentation had one fatal case among the mothers, which is not credited to the method of delivery. The morbidity among the mothers was 6 per cent.; the fetal mortality, 50 per cent. Craniotomy and high forceps application had 6 per cent. maternal mortality, and 30 per cent. maternal morbidity. Prophylactic version had 1.05 per cent. maternal mortality, 11.5 per cent. maternal morbidity, and 20 per cent. fetal mortality.

The induction of labor in thirty-four cases had a maternal mortality of 1.9 per cent., and 47 per cent. fetal mortality.

If prophylactic version and induced labor be considered together, the maternal mortality was 1.3 per cent.; fetal mortality, 27.8 per cent.; while the puerperal period was complicated in 10 per cent. of the mothers. Where patients were delivered by the high application of forceps, the maternal mortality was 1.3 per cent.; the fetal mortality, 38.5 per cent.

When Cesarean section was performed for the relative indications, the

¹ Journal of Obstetrics and Gynecology of the British Empire, January and February, 1909.

maternal mortality in all cases varied from 2.5 to 3.4 per cent., with a fetal mortality of 1.7 per cent.

Those operations which enlarge the pelvis had, in this clinic, no maternal mortality during labor, but a fetal mortality of 4.3 per cent.

When craniotomy was performed with a living child the maternal mortality showed one fatal case, and 7.8 per cent. morbidity in the puerperal period.

CONTRACTED PELVIS: A STUDY OF THE COURSE OF LABOR AND THE INDICATIONS FOR OPERATION. Under this title, Peham publishes a monograph (Wien, Alfred Holder, 1908) giving the results of his study in Chrobak's clinic.

In 13,000 labors there were 975 with contracted pelvis, or 7.5 per cent. If from these cases are excluded the irregularly contracted, the osteomalacic cases and those complicated by anomalies in the placenta, eclampsia, and severe disease of the mother, and the cases of lesser grade of pelvic contraction, in which the weight of the child remained under 2250 grams (5 pounds), the remaining cases were 885. They were practically divided into rachitic, flat, and symmetrically contracted pelves. The pelvis was measured by digital examination, and in pelves not rachitic 1.5 cm. (0.6 inches) was taken from the anteroposterior diameter.

The greatest diagonal conjugate classified under contracted pelvis was 11 to 11.5 cm. (4.4 to 4.6 inches). Primiparæ and multiparæ were separately classified; the age of the primiparæ, the course of previous labor in the multiparæ, the average weight of the child, the average length of labor, and the result in mothers and children—all are critically estimated.

The operative treatment of these cases is reported in detail, and the most interesting cases of spontaneous labor are also analyzed.

Among the 885 cases were 641 spontaneous labors, or 72.42 per cent. The mortality among the children in contracted pelvis was 2.14 per cent., and in all spontaneous labors 3 per cent. The maternal mortality was 0.11 of 1 per cent. in contracted pelvis, and 0.15 per cent. in spontaneous labors. In uncomplicated cases the maternal mortality was nothing. The smallest pelvis through which spontaneous labor occurred had a true conjugate of 7 cm. (2.8 in.), and the smallest children in spontaneous birth weighed 3000 grams (6 lbs.).

Peham believes that in carefully selected cases prophylactic version still has a place. In highly contracted pelvis with true conjugate from 7.5 to 7 cm. (3 to 2.8 inches), induced labor may be terminated by version, and a living child obtained.

The high application of forceps in a contracted pelvis is a more difficult operation than version and more dangerous for mothers and children, but less serious than operations opening the pelvic girdle. The high application of forceps should only be performed when the child is in

good condition, and moulding and engagement makes a successful delivery probable.

Craniotomy upon the living child in cases admitted to a hospital should be declined. In its place induced labor, prophylactic version, the high application of forceps, Cesarean section, or enlargement of the pelvis should be selected. The practising physician must consider the life of the child in selecting operations when the time has passed for induction of labor and the high application of forceps is not indicated. Induced labor has its best field in multiparæ when children have previously been lost at full term. In highly contracted rachitic pelves, induced labor with prophylactic version may be successful in the hands of the practitioner, but in the hospital these cases should be subject to enlargement of the pelvis.

Cesarean section should only be employed upon those cases which have not been examined outside of the hospital, where the membranes are unbroken or have but recently ruptured.

Hebostiotomy is considered a dangerous operation for the mother, although a practicable one. The average practitioner cannot attempt it, and it should be reserved for hospitals and specialists.

As the result of these methods in version there was no maternal mortality, but 40 per cent. of the children died. In forceps operation there was no maternal mortality, but 17.2 per cent. of the children died. The average length of labor in these cases was forty-one hours. On the average forty-four and one-half hours were allowed to elapse before the high application of forceps was made. This practice was followed by the death of two mothers, and 19.2 per cent. of the children. Cesarean section was performed in twenty-nine cases, with one death. Hebostiotomy was performed once, and symphysiotomy was not done.

Chrobak contributes an introduction to this book in which he gives his views upon the subject of contracted pelvis and the management of labor in these cases. He thinks that possibly too much attention is given to pelvic measurements and too little to the frequency and the strength of labor pains and the moulding of the fetal head. Digital measurement of the pelvis is especially important.

Obstetric surgery is most successful in hospitals, and the average practitioner in the patient's home cannot successfully perform these operations. The effort to save the life of the child at the risk of the mother is not justifiable under these conditions.

Hegar¹ writes of the causation and frequency of contracted pelvis. This complication is most common in those countries where women work in sedentary occupations, with poor nutrition, and do not nurse their children. Thus, in Germany, from 12 to 20 per cent. of pelves are found to be contracted. In Norway and Denmark, about 4 per

¹ Münch. med. Woch., August 25, 1908.

cent. In the latter countries many women work outdoors under healthful surroundings; alcoholism is infrequent; and the women nurse their own children.

In many cases the pelvis is undeveloped because the whole body of the mother is also imperfectly shaped. In many of these cases there is stenosis of the upper portion of the thorax. To prevent pelvic contraction females should have proper feeding, good hygiene, exercise in the open air, and avoid the so-called social pleasures. Certain diseases like rickets should also be avoided. Chronic infections, especially tuberculosis, often cause pelvic deformity. Cretinism is a further cause.

DELIVERY IN A RENIFORM PELVIS. Champneys¹ reports the case of a woman having a generally contracted flat reniform pelvis with slight scoliosis, the true conjugate being two and one-half inches. The patient was seen in 1891, and it was determined to attempt the induction of labor. For six days attempts were made to bring on labor by laminaria tents and bougies. When the pains began the membranes ruptured and amniotic liquid escaped prematurely. The patient was anesthetized, the cervix dilated by the hand, the head pressed down into the pelvic brim, when it was found that the uterus was so inert that a fold of uterine wall was caught between the head and the brim of the pelvis. The head was turned in the most favorable position with the occiput to the right a little behind (the pelvis being reniform with left scoliosis), and an assistant held the head firmly in this position. The forceps was applied with the right blade somewhat behind the occiput, and the left blade somewhat in front of the extremity of the head, the blades being nearly in the right oblique diameter of the pelvis. The head was extracted without much difficulty, rotating within the forceps, the blades finally fitting to the sides of the head. The child weighed four and one-half pounds twenty hours after labor. The true conjugate of the pelvis measured two and one-half inches; the transverse diameter of the brim four and one-quarter inches.

Sixteen and a half years afterward Champneys examined mother and child. The child was then five feet four inches in height, well developed, in good health, and intelligent, and was working as a chemist's assistant.

In considering the case, Champneys believes that the reniform shape of the pelvis, which gave space upon the right side for bringing down the occiput, and the left scoliosis which increased this space, were favorable elements. The fact that the forceps was applied accurately to the sides of the head also helped. At the present time, in such a case, Champneys states that he would certainly perform Cesarean section.

SPONTANEOUS LABOR IN CONTRACTED PELVIS is the title of a paper by Leisewitz.² He criticises the statements of Baisch, Peham, and

¹ Journal of Obstetrics and Gynecology of the British Empire, June, 1908.

² Archiv f. Gynäkologie, 1908, Band lxxxvi, Heft 1.

Bürger, who would make those pelves contracted which had a true conjugate of 11 to 12 cm. (4.4 to 4.8 inches), measured internally. In many cases admitted to a hospital the head has been pressed sufficiently far into the pelvis to make the internal measurements of the anteroposterior diameter impossible. He believes that the external measurements should not be neglected, and would take in general an external conjugate of 18 to 18.5 cm. (7.2 to 7.4 inches) as the greatest diameter found in contracted pelvis; and an internal anteroposterior diameter of 10 cm. (4 inches) as the smallest anteroposterior measurement.

In 15,338 cases of labor in Leopold's clinic in Dresden, there were 6865 contracted pelves—a frequency of 44.6 per cent. Excluded from these statistics are those cases terminating in abortion, placenta prævia, and those having children weighing less than 2500 grams (5 lbs.).

Cases ending in the usual application of forceps are not excluded, and also those terminating with operation. The number of spontaneous births in 6092 cases with accurately reckoned contracted pelvis were 86.9 per cent. in primiparæ; 81.1 per cent. in multiparæ.

With reference to the different sorts of pelvis in the symmetrically contracted, 51.2 per cent. of spontaneous labors occurred; in flat pelvis, 14.3 per cent.; in flat rachitic pelvis, 12.4 per cent.; in symmetrically contracted rachitic pelvis, 29.9 per cent. The number of primiparæ was greater than that of multiparæ in the clinic. The most common variety was the symmetrically contracted pelvis; next, the contracted flat rachitic pelvis; while the simple flat and only flat rachitic pelvis is not very common.

In the pelvis in which the anteroposterior diameter was measured internally, where the conjugata vera was from 8.5 to 7.6 cm. (3.4 to 3.04 inches), among 931 cases there were 605 spontaneous births, or 66.5 per cent. With the true conjugate of 7.5 to 6.5 cm. (3 to 2.6 inches), in 355 cases there were 106 spontaneous births, or 29.8 per cent.

The percentage of cases requiring operation was among primiparæ and multiparæ, 15.8 per cent. In spontaneous birth among primiparæ the maternal mortality was 0.3 of one per cent.; the maternal morbidity 11.1 per cent. in spontaneous labor. In operation, the maternal mortality was 2.9 per cent.; the maternal morbidity, 20.3 per cent. In multiparæ, in spontaneous labor, the maternal mortality was 0.3 per cent.; the morbidity, 6.6 per cent. With operation, the maternal mortality was 1.4 per cent.; the morbidity, 13.5 per cent.

Among the children in spontaneous labor, in primiparæ, the mortality was 1.4 per cent.; in multiparæ, 1.2 per cent. When operation was performed among primiparæ, the mortality was 21.6 per cent.; among multiparæ, 22.6 per cent.

In the whole series of cases the morbidity among the children was 45 per cent. In primiparæ, so long as the posterior fontanelle rotated anteriorly, and the head engaged, the chances are favorable for the

children in generally contracted pelves. In other forms, the chances for the children were less good. The percentage of mortality among the children after operation in pelves with a true conjugate from 8.5 to 7.6 cm. (3.4 to 3.04 inches), was 27.6 per cent.; with conjugata vera from 7.5 to 6.5 cm. (3 to 2.6 inches), the operative mortality of the children was 23.2 per cent.

Perforation was performed in 11.5 per cent. of the operations done. The general mortality among the children in primiparæ attending operation, excluding perforation, was 9.7 per cent.; among multiparæ, excluding perforation, 16.1 per cent.

Leisewitz believes that an improvement in these results is only to be obtained by a closer study of each case, and a most careful choice in the matter of treatment. He criticises the selection of induced labor with prophylactic version, unless there be some condition especially calling for it, as transverse presentation, placenta prævia, or eclampsia.

In 170 cases of version and extraction, in contracted pelves, the maternal mortality was 1.1 per cent.; morbidity, 6.4 per cent.; the fetal mortality was 23.5 per cent.

Version and extraction must be limited because the disproportion between the head and the pelvis in many cases is so great that after version, perforation of the after-coming head is often necessary. Where the child is small and the pelvis is flattened, it is sometimes successful. The operation should not be a prophylactic one, but performed like any other for definite indications.

Leisewitz reports 85 cases of induced labor with 1.1 per cent. maternal mortality; 29.4 per cent. fetal mortality.

Leisewitz raises the question as to what the general practitioner can do with cases of contracted pelvis. In the presence of contracted pelvis, he may choose to allow labor to develop spontaneously, and may perform embryotomy or delivery by surgical means. With patients in a hospital, one occasionally waits thirty hours for spontaneous labor to give birth to the child. In private practice this is often difficult because of the suffering of the mother and the anxiety of her friends.

While craniotomy is practically without maternal mortality in a hospital, he raises the question, "Can this be true in private practice?" There are also difficulties in the way of performing hebostiotomy or Cesarean section, because the patient may not consent. The transportation to the hospital and remaining in the wards is not agreeable to many patients.

As regards the induction of labor, the decision must be based largely upon the circumstances of the case and the value set upon the life of the child.

Hannes,¹ from the clinic at Breslau, reports his results in the treatment

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1908, Band lxii, Heft 2.

of contracted pelvis. In defining contracted pelvis the writer tends to consider as such all pelves in which labor is difficult by reason of the essential disproportion on the side of the mother. In selecting treatment, every attempt is made to secure spontaneous labor. Prophylactic version is declined, and so is all manipulation not absolutely necessary for the delivery of the child. The fetal mortality attending prophylactic version is so great as to condemn it. In securing spontaneous labor, he lays stress upon the merits of morphine, which relaxes muscular spasm and gives rest. The element of the adaptability of the fetal cranium to the pelvis is also of great importance.

The percentage of spontaneous births is 64.2 per cent. There was no maternal mortality. Among the children fifteen died immediately after birth; the fetal mortality was 4 per cent.

The high application of forceps was made in 1.8 per cent. of the cases, with no maternal mortality, but a fetal mortality of 50 per cent. Prophylactic version being discarded, version was performed as a means of extraction in the presence of labor in 9.2 per cent. There was no maternal mortality, but a fetal mortality of 23 per cent. There were 7 hebostiotomies, with no maternal mortality, and a fetal mortality of $14\frac{2}{7}$ per cent. There were 67 Cesarean sections, or 11.2 per cent. of the cases; 11 of the mothers died, 3 from infection, this mortality occurring before the use of rubber gloves. Eclampsia was also a cause of mortality after section.

After the use of rubber gloves, the mortality rate of Cesarean section was 2.3 per cent.

Craniotomy was done in 5.1 per cent. nine times upon the living child. There were 22 mothers operated upon, and 2 of these perished from septic infection. Rupture of the uterus occurred in 3 patients, 2 of them dying from peritonitis. The induction of labor, usually at the end of the ninth and beginning of the tenth month, was performed in 66 cases. Of these, but 21, or 32 per cent., terminated spontaneously. One of the mothers died of infection; one died of myocarditis.

Of the 66 children, 27 perished, a mortality rate of 40 per cent. The induction of labor on account of its high fetal mortality is not an operation of choice in this clinic.

Prolapse of the Umbilical Cord with Normal Attachment of the Placenta. Stern¹ reports a case of prolapse of the umbilical cord. Where placenta prævia could be excluded, the tear in the membranes showed that the placenta was at least 4 cm. above the internal os. As a cause for this condition there was present a small fetus and sudden discharge of a free quantity of amniotic liquid, with resulting sudden contraction of the uterus. The lower uterine segment was emptied because the fetus was in a transverse position, and there was no presenting part at the pelvic brim.

¹ Monatschrift f. Geburtshülfe und Gynäkologie, 1908, Band xxviii, Heft 2.

Secondary Face Presentation with Prolapse of the Arm. Fellenberg¹ reports the case of a primipara who had labor pains for two days, and in whom the amniotic liquid had escaped forty-six hours before examination. The midwife reported that the child at first was in the second position, head presentation, heart sounds low on the right side, the back directed toward the right, and the head in the pelvis. The os was completely dilated, the head in the pelvic cavity, the smaller fontanelle toward the right side, and a hand had prolapsed.

As labor had come on at eight months' gestation, the midwife did not summon aid, hoping that as the fetus was not large, spontaneous birth might occur. The arm, however, descended instead of the head, and after a short time further examination showed a face presentation, the chin anterior, and on the right side of the face the fetal hand. The heart sounds could be heard in the same place in which they were first detected. When the patient was seen two hours later the situation had not changed. The heart sounds were very frequent, the chin was anterior beneath the symphysis, and the long diameter of the face in the anteroposterior pelvic diameter. The forceps was applied and the child extracted without difficulty.

When, however, the chin was delivered, it was found that the back of the child was anterior instead of the thorax. The head was twisted completely upon the neck over the right shoulder so that the face looked posteriorly. The prolapsed right arm was on the left side of the head, lying along the chin. The child was asphyxiated and could not be revived. There was slight laceration, which readily healed with sutures, the mother making a good recovery.

An autopsy upon the child could not be obtained, so that the condition of the vertebral column could not be ascertained.

Transverse Position; Face Presentation High in the Pelvis, and its Treatment by Forceps. Ziegenspeck² reports the case of a multipara who had in labor the second position of face presentation. The head was at the entrance of the pelvis. The abdomen was protuberant; the child was large and did not descend into the pelvis. The cervix was very thin, entirely dilated, and the amniotic liquid had escaped.

As the conditions were not favorable for version, the forceps was applied and the face brought transversely into the pelvic cavity. One blade was over the face the other upon the cranium. The forceps was then removed and reapplied in the oblique diameter of the pelvis, the left blade anterior. Without much difficulty the head was brought down, the face turned in the anteroposterior diameter, and the chin delivered under the symphysis. The child cried speedily after delivery, showed no injury, and remained in good condition.

Care was taken to make traction at first in the axis of the pelvis downward and backward. In this way the head was not brought against

¹ Zentralblatt f. Gynäkologie, 1908, No. 39.

² Ibid., No. 24.

the symphysis, and the force exerted by traction was directed in the most favorable manner.

Ziegenspeck concludes that in the hands of a physician well versed in the use of forceps, axis traction can efficiently be made with the ordinary instrument by using the left hand to make pressure downward and backward, while the right hand increases traction by raising the handles. The operator may vary the line of traction more easily with a simple instrument than with those more complicated.

Hemorrhage Complicating Labor. Göth¹ calls attention to the ordinary methods of compressing the uterus after labor for control of hemorrhage. He also refers to Jean Reure's method, which consists in placing the right hand along the vertebral column, grasping the posterior wall of the uterus, while the left hand placed against the symphysis makes counterpressure, or effects the same purpose by counterpressure against the pelvic brim.

At the Fourth International Congress, in Rome, Loserstein advocated rotating the uterus by its long axis and then carrying it forcibly against the symphysis pubis. Another method of controlling hemorrhage consists in grasping the uterus and pressing it downward and backward against the abdominal aorta. Göth would grasp the uterus with one hand, drawing it upward, while with the thumb and fingers of the other hand he would compress the vessels at the lower border of the contraction ring. In cases where the uterus was so dilated that it was difficult to find it, this method caused prompt uterine contraction and checked hemorrhage. The hand which grasps the uterus can rub it vigorously and carry it far up against the pubis. By this combined manipulation the cavity of the uterus is compressed, while the flow of blood is checked by pressure upon the uterine vessels at the lower uterine segment.

He reports 8 cases in which this manipulation was successfully carried out, and 2 cases in which all manipulation, including his method, failed utterly, and it was necessary to resort to tamponing the uterus with gauze to check hemorrhage.

Zickel² reports the case of a weak multiparous patient who had hemorrhage following the expression of the placenta by Credé's method. Massage and compression of the uterus failed to control it, the uterus was pressed downward, edematous, lying in the vulva, and so deep in the pelvis that it was impossible to grasp it securely. The uterus was then carried upward and bent strongly over the pubis, when the patient collapsed.

The writer feared air embolism, and compressed the uterus strongly with both hands, when he heard the expulsion of air-like flatus from the womb three or four times. The patient speedily rallied and made a good recovery.

¹ Zentralblatt f. Gynäkologie, 1908, No. 15.

² Ibid., No. 34.

Sigwart¹ calls attention to Momburg's method² for controlling hemorrhage from the uterus and pelvic organs.

This consists in rendering the lower portion of the body anemic by pressure exerted upon the aorta and spermatic vessels. In a case in which the uterus could not be made to contract, and hemorrhage continued, Sigwart applied this method by making vigorous compression upon the vessels of the lower abdomen, especially the aorta, with an elastic bandage. Bleeding from the genital organs almost immediately ceased, and the uterus contracted and remained firm. The elastic bandage was loosened after fifteen minutes, and the hemorrhage did not return. The patient made a good recovery.

THE TREATMENT OF UTERINE HEMORRHAGE WITH SERUM. Busse³ reports ten cases of uterine hemorrhage in the non-pregnant condition, treated by the injection of 10 c.c. of human blood serum, freshly obtained. This was taken from healthy persons from the vein of the elbow, under scopolamin anesthesia. The patient's recovery was prompt and her improvement in strength, remarkably good.

No ill effects were observed, except in two cases there was transient loss of appetite.

If this method of treatment is available in the non-pregnant, why may it not be employed in protracted hemorrhage in the toxemias of pregnancy, before or after the expulsion of the contents of the uterus? In toxemia the cause of hemorrhage is the pathological condition of the patient's blood serum. The substitution of healthy serum, if it is efficient in other cases, would certainly seem indicated in this. Obstetricians have long known that the most uncontrollable hemorrhages which they are called upon to treat, arise in septic toxemia and after abortion, or after the expulsion of the uterine contents, in some cases at or near full term.

FATAL HEMORRHAGE AFTER ABORTION AT THE FOURTH MONTH. Hense⁴ reported before the Obstetrical Society at Berlin the case of a multipara, aged forty-four years, four months pregnant, who had a daily hemorrhage for eight weeks, and quite severe bleeding for fourteen days. The uterus was dilated with laminaria tents, and the following day its contents were removed without difficulty under chloroform anesthesia. Hemorrhage persisted, and resisted massage, hot irrigations, and tamponing of the uterus. As a last resort, the uterus was removed through the vagina with the use of clamps and without anesthesia. The patient did not rally and died soon after the operation.

On examination, the uterus was normally developed, its muscular tissue normal, and there was no wound or laceration.

¹ Zentralblatt f. Gynäkologie, 1909, No. 7.

² Zentralblatt f. Chirurgie, 1908, No. 23.

³ Zentralblatt f. Gynäkologie, 1909, No. 7.

⁴ Ibid., 1908, No. 29.

Microscopic examination showed a normal muscle with a normal decidua. The fatal termination seemed due to the prolongation of the bleeding and the fact that the blood had become so fluid that it could not coagulate.

In fatal hemorrhage in parturient women, the absence of other conditions must raise the suspicion of *syncytioma malignum*. This need not be situated in the genital tract, for observation has shown that fetal elements enter into the blood, and so ruin its coagulability, and that hemorrhage would occur without recognizable lesion; while metastatic deposits are found in the large glandular organs of the body. If syncytioma be absent, the writer has seen successful results in the treatment of repeated and dangerous hemorrhage after labor by the prompt renewal of the intra-uterine tampon and the application of the interrupted electric current, one pole being placed over the uterus, the other beneath the occiput or over the lower dorsal spine.

The hypodermic injection of strychnine, atropine, and ergot is also efficient. Salt solution should be injected in these cases with great care, as much harm can be done by an excessive quantity. The action of adrenalin is too transient to be of more than temporary value.

The inversion of the patient in the Trendelenburg posture, and the rendering of the lower half of the body as anemic as possible by bandaging, is also of value. The head of the patient should be low, oxygen may be inhaled, or the air of the room made as fresh as possible. The bladder should be frequently emptied by catheter, and if the patient is in a condition of great nervous shock and fright, absolute quiet, heat applied to the base of the brain, and a hypodermic injection of morphine are indicated.

I recall the case of an anemic multipara in the Jefferson Maternity, in whom no evidence of syphilis or malignant disease could be found. The labor was comparatively easy, occurring about mid-day, and every precaution was taken successfully to avoid hemorrhage. During the night severe postpartum bleeding developed, which was checked by the use of the intra-uterine tampon. On two other occasions hemorrhage recurred at night, staining through the gauze, and rendering necessary the renewal of the tampon. The patient made a tedious recovery, complicated by severe anemia.

Direct aortic compression is one of the most valuable methods for treating postpartum hemorrhage in cases which are not toxic. If the patient's abdominal wall be thin and relaxed, this may be accomplished by pressure exerted through the abdominal wall. If the vagina is dilated or dilatable, the hand may be carried into the lower uterine segment and closed, and the knuckles placed firmly against the aorta above the pelvic brim. Counterpressure may be made by the other hand, or by an assistant, through the abdominal wall. Bleeding may be controlled absolutely in this way so long as the operator can maintain

the pressure. From ten to fifteen or twenty minutes may thus be gained, during which time hypodermic stimulation may be given and other methods employed to check the bleeding.

Fatal Hemorrhage from the Vagina in a Newborn Child. McKerron¹ reports the case of a female child, weighing six pounds, born after a spontaneous and comparatively easy labor. The child, though fairly well developed, was not vigorous. On the fourth day after birth, slight hemorrhage from the vagina occurred, increasing on the eighth day, and becoming profuse. Cotton soaked in adrenalin solution was packed into the vagina, but failed to arrest the bleeding. The child collapsed, and from a small scratch on the upper lip more than a dram of blood was lost. It died a few hours afterward, and an autopsy could not be obtained. The stools were normal, and no enlargement of the liver or spleen could be detected.

While congestion of the uterine mucous membrane has been observed in autopsies upon infants, actual hemorrhage from the vagina is rare. These children are not *hemophilic*, for such are usually vigorous.

No history of syphilis could be obtained, and there was no sign of infection.

The mother stated that she bled very easily, and this fact, together with the hemorrhage from the slight scratch upon the lip, would place the case in the category of hemophilia.

The Treatment of Postpartum Hemorrhage. Edgar² calls attention to the importance of the prophylactic treatment of hemorrhage by the prevention of toxemia, and the restorative treatment in patients suffering from general anemia. In the third stage of labor ergot should be employed in all cases. He urges the importance of allowing the uterus to rest for at least half an hour after the expulsion of the child.

In applying Credé's method, his original directions should be followed, namely, to grasp the uterus entire so that the fundus lies in the palm of the hand, while the fingers make pressure behind the fundus, and the thumb in front. The uterus may thus be grasped firmly, carried far up against the symphysis, and pressed downward and backward into the pelvic brim. In an emergency, the uterus may be grasped externally with one hand, while the other in the vagina seizes the cervix, making pressure upon the vessels at the side of the cervix. With the ulnar border of the hand upon the fundus, pressure may also be made upon the abdominal aorta and vena cava.

Edgar thinks that the hand should be introduced within the uterus as rarely as possible, as the thin relaxed uterine walls are easily ruptured.

The treatment of the anemia, shock, and empty bloodvessels which complicate puerperal hemorrhage is that of any similar surgical con-

¹ Journal of Obstetrics and Gynecology of the British Empire, December, 1908.

² American Journal of Obstetrics, December, 1908.

dition. In the puerperal period, to avoid hemorrhage, the patient should be protected against mental emotions, disturbances of the general circulation, and vitiated conditions of the blood. The retention of placental tissue or of the membranes may also cause hemorrhage; so may blood clots within the uterus, or great distention of the bladder or rectum. The patient should not be allowed to assume the upright posture until involution is well advanced.

In the presence of puerperal hemorrhage, the uterine cavity should be explored for retained material. If necessary, dilatation should be practised and the contents of the uterus removed in any convenient manner.

Edgar reports the case of a primipara who had severe hemorrhage seven days after labor, developing suddenly during sleep. Digital examination of the uterine cavity brought away a piece of placenta as large as the thumb. Its removal and a hot saline intra-uterine douche ended the hemorrhage.

He also reports the case of a patient who, two and a half weeks after the birth of her second child, was taken with so severe a uterine hemorrhage that a fatal issue was feared.

Examination of the uterus revealed a softened and thickened area in the anterior wall just above the cervix. Scrapings were taken for microscopic examination. The patient had a severe hemorrhage two days later, scrapings from the uterus had been sent for microscopic examination, and chronic endometritis was diagnosed. Only after the uterus had been removed did the hemorrhage permanently cease.

Ectopic Gestation. RUPTURED ECTOPIC GESTATION OCCURRING IN A RUDIMENTARY UTERINE HORN. Hicks¹ reports the case of a multipara who nine years before coming under observation had an attack of peritonitis on the right side thought to be appendicitis. Nine weeks before admission to the hospital she had sudden abdominal pain on the left side, menstruation being fourteen days overdue. Hemorrhage from the vagina began a week later, but the patient did not come under observation until six weeks after this time.

On examination, a rounded, firm tumor was found attached to the left side of the uterus, resembling a fibroid. The pain and hemorrhage suggested that of abortion. The pain, however, was too great for fibroid tumor, and the suddenness of the onset, followed some days after by uterine hemorrhage, suggested ectopic gestation.

At operation, a right hydrosalpinx was found with the left horn of the uterus projecting, and containing a blighted ovum attached to the intestine and omentum. The left tube was normal and its fimbriated extremity open.

¹ British Medical Journal, February 8, 1908.

Supravaginal hysterectomy was performed, with removal of the right tube and ovary, the left remaining. The intestines were firmly attached to the site of the rupture on the posterior aspect of the gestation sac. At this point the wall of the intestine was nearly half an inch thick. The lumen of the bowel was not lessened. The patient recovered.

Examination of the specimen showed ruptured ectopic gestation in the left horn of a bicornate uterus.

ECTOPIC PREGNANCY IN THE STUMP OF AN EXCISED TUBE, CAUSING INTESTINAL HEMORRHAGE. Vineberg¹ reports the case of a patient who applied for the relief of repeated attacks of bleeding from the anus. The patient had borne children, and had had several abortions, some of them induced. The left tube and ovary had been removed without much relief. The pain in the abdomen had been accompanied lately by bleeding from the rectum. The pain was in the left groin, colicky, and followed by a movement of the bowels containing pure blood in clots. During the next twenty-four hours the bowel movements were blood-stained, then becoming normal until the next attack. Menstruation had not occurred for over two months.

Examination of the rectum showed hemorrhoids which had not bled, but the entire rectum and lower segment were found to be normal. The uterus was slightly enlarged and very hard to the touch. On the left side was an irregular mass close to the womb, not very movable, nor sensitive. It was semi-elastic. It was thought that this mass was a foreign body, a sponge or instrument, left in the abdomen at the operation, fourteen months previous, when the left tube and ovary were removed.

Upon operation a stump of the Fallopian tube at the left side of the uterus was covered by a dark bluish mass about the size of an egg. The sigmoid flexure covered the outer and lower border of the sac. The sac was removed, and upon opening it an embryo of about eight weeks was found. As the uterus was in a pathological condition, and the right tube and ovary had many adhesions, panhysterectomy was done, followed by relief and a good recovery.

On obtaining a further history of the case, it was found that there had been a large ovarian abscess on the left side, with the tube included, and containing pus. The bowel was adherent to the wall of the abscess.

The interesting points in the case are the implantation of the ovum in the very short stump of tube left after extirpation of the pyosalpinx and ovarian abscess.

Intestinal hemorrhage complicating this condition is most unusual. Vineberg suggests that this was caused by the trophoblasts which penetrated the surrounding tissue of the bowels from the ovum.

IMMEDIATE VERSUS DEFERRED OPERATION FOR INTRA-ABDOMINAL HEMORRHAGE WITH TUBAL PREGNANCY. At the meeting of the

¹ American Journal of Obstetrics, April, 1908.

American Gynecological Society, May 26, 27, and 28, 1908, a symposium upon this subject elicited much that was interesting.

Krug did not believe that delay in operation should be practised indefinitely, nor that the patient should be subjected to hasty operation. Comparatively few patients died from actual hemorrhage, and in most fatal cases hemorrhage had been seriously aggravated by curettage, too vigorous bimanual examination, or some radical interference.

Janvrin's experience had convinced him that once the diagnosis of tubal pregnancy was made, there should be no delay in opening the abdomen. If a competent surgeon was not present, he should be procured as soon as possible. The sac of the ectopic gestation, placenta, and fetus, blood clots and fluid blood, should be removed as quickly as possible with the least manipulation. Rapid operation adds little to the existing shock, and its ill-effects are readily overbalanced by saline solution and stimulants.

Simpson urged a further study of diagnosis, that ectopic pregnancy might be recognized as soon as possible. Operation in acute illness is always dangerous, and he believed that intra-abdominal hemorrhage due to ectopic gestation did not have as high a mortality as prevalent teaching would indicate. He analyzed 575 cases of ectopic gestation taken from miscellaneous literature in the last five years. Operation was done within twenty-four hours for rupture in 115 cases, with 22.6 per cent. mortality. Operation was delayed until after twenty-four hours for rupture in 461 cases, with 6.7 per cent. mortality.

The cases in the two groups were not parallel, there being, where early operation was done, a larger percentage of cases critically ill; 75 patients were in a critical condition at the time of operation within twenty-four hours, with a mortality of 34.6 per cent.; 24 patients equally ill, not operated upon until after twenty-four hours, had a mortality of 29.1 per cent.; he had 17 cases in which operation was deferred, without death. These added to the 5 cases reported by Robb, and 5 by Stillwagen, gave 27 cases with deferred operation, without mortality. In 100 consecutive cases of ectopic gestation, no patient bled to death at the time of rupture; there was one death from hemorrhage at the time of operation, in the hands of a skilful surgeon of his acquaintance; and one of his own patients died from hemorrhage, plus immediate operation. In this series of more than 100 cases, the death rate was slightly less than 4 per cent.

He concludes that ectopic pregnancy, while always serious, is not necessarily immediately fatal. Operation is usually required, and before that the patient should be treated with extreme care. If the patient is actually ill, operation is always serious, especially if the operator be unskilled, or the surroundings unfavorable. The decision for immediate operation should rest upon a low mortality in the individual

operator's hands rather than on the essentially high mortality with which the disease has been credited.

Vineberg had one death in eighty-four cases operated upon, this occurring three weeks after from ether pneumonia. He believed that gynecology would take a long stride backward if measures of delay were adopted in dealing with ruptured ectopic gestation. For successful operation, it was necessary that no undue violence be used to avoid tearing the broad ligament, that the ligature be applied tightly to efficiently stop bleeding, and that too much time be not lost in trying to cleanse the abdominal cavity.

Montgomery drew attention to the fact that measures which would ordinarily be employed for rallying the patient from profound shock are reprehensible in ruptured ectopic gestation. The only hope for the patient outside of operation is that with decreased vascular tension the clotting of blood in the torn surfaces will become firm enough to prevent further bleeding. A patient giving the symptoms of free internal hemorrhage should not be subjected to manipulation for diagnostic purposes because of the danger that such manipulation will excite fatal bleeding.

Frederick, from his experience, believed that but 5 per cent. of ectopic pregnancies are accompanied by dangerous hemorrhage at the time of rupture. In the remaining 95 per cent., as the result of shock and lowered vascular tension, together with the small size of the vessels torn, the bleeding is controlled, at least temporarily, by coagulation. Later, bleeding may recur. He believes that no definite rule can be laid down for all cases; each must be judged according to the condition present, remembering that there are 95 chances in the 100 that the hemorrhage will cease, at least for a time.

Grandin had seen 2 cases in 100 die, and these were treated expectantly. He believed that immediate operation was best.

Manton laid stress upon the value of good judgment in the treatment of each individual case, and that immediate operation in the majority of cases was best.

Boldt would not operate upon a patient in profound collapse. Operation, however, should not be deferred in patients with active symptoms of partial tubal rupture or tubal abortion. If the patient shows evidence of slight improvement, the surgeon should wait until rapid operation can be done with comparative safety. The patient should be in a hospital under constant observation, where operation can be done within twenty to thirty minutes from the first signs of renewed bleeding. A tight bandage should be put upon the upper part of both thighs to act as a tourniquet, and intravenous injections of saline should be begun as soon as the patient is placed upon the operating table. Strychnine and camphor should be used hypodermically.

Where immediate operation is indicated, and the patient is first seen

in her home, operation should there be done to avoid the shock of transportation. As soon as the patient has a fair pulse, is conscious, and has a normal skin, operation should be done.

In cases of hematocele, the patient being in good general condition without symptoms of continuous hemorrhage, operation may be deferred. In a hospital, under continuous supervision, such patients may be allowed to go on in spontaneous recovery so long as they do well.

Martin would avoid undue haste in operating upon patients in shock. The judgment of the surgeon should decide the time for operation, and the abdominal or vaginal route should be chosen in accordance with the nature of the case.

Gordon has lost no patient operated upon for ectopic gestation. He has endeavored not to operate on a patient in profound shock, and has selected the abdominal or vaginal route, in accordance with the circumstances of the case. In immediate collapse, he prefers to wait rather than to operate.

Robb urged conservatism in the treatment of ruptured ectopic gestation because he believes from his experiments and from clinical observation, that patients died more as a result of shock than of hemorrhage. He believes that operation adds to preëxisting shock, and was often sufficient to turn the scale. In Robb's opinion, tubal abortion, so far as hemorrhage is concerned, is not more dangerous than abortion occurring through the cervix. The sudden removal of a large quantity of recently accumulated fluid in the abdomen is dangerous, and may be followed by fatal syncope. In cases in which bleeding sufficient to cause death had occurred, patients were rarely seen in time to be saved by operation.

Bovée would always adopt the abdominal route, and would select the time of operation in accordance with the condition of the patient. The danger of infection in hematocele is an added reason for prompt operation.

Pfannenstiel believes in operating as soon as possible, but without precipitation. The general rules of surgery should be applied to these cases without undue haste.

The consensus of opinion in this symposium indicated that good surgical judgment is needed in successfully dealing with ruptured ectopic gestation. The only safe method of treatment lies in operation. Its success will depend upon the judgment of the operator in seizing a favorable moment for operation, and in his skill and experience, which will enable him to rescue the patient with the least risk.

Pubiotomy. The past year has seen no essential change in the status of the operation of pubiotomy. The attention of European obstetricians has been largely directed to extraperitoneal Cesarean section. While pubiotomy is still performed in many European clinics, its disadvantages are such that it is not accepted as an ideal operation.

American obstetricians have not generally adopted it, and it is considered in this country as an operation quite as formidable as Cesarean section.

At the meeting of the American Gynecological Society, May, 1908, Williams presented a paper with the title: "Is Pubiotomy a Justifiable Operation?"¹ He reported 13 operations, 9 by himself and 4 by assistants, with no maternal and three fetal deaths.

There were 6 generally contracted rachitic pelves, 2 flat rachitic, 2 generally contracted, and 3 funnel-shaped pelves. In the first 10 the conjugata vera was between 7 and 8.5 cm. (2.8 to 3.4 in.); in the 3 funnel-shaped pelves, the transverse diameter of the outlet measured 7 cm. (2.8 in.). With two exceptions, the operation was not undertaken until after the patient had been in the second stage of labor from two to ten hours. The presenting part had failed to advance in spite of strong pains. The vulva was dilated manually before beginning the operation, and Doederlein's method was followed, with one exception, in which Gigli's open method was employed. Delivery was immediately accomplished by forceps in 10, and breech extraction in 3 cases. Hemorrhage was moderate in all but one case, where there was a deep communicating vaginal tear and profuse bleeding and shock, requiring vigorous treatment; 9 of the 13 patients were primiparæ, but there was less damage to the birth canal than has been reported in many cases. There were 3 perineal tears requiring suture; the bladder was uninjured, and at no time was the urine blood-stained. After the expulsion of the placenta the wounds in the vagina and perineum were repaired, and healed satisfactorily. After closing the upper pubiotomy incision with interrupted catgut sutures, a small drain of iodoform gauze was passed through the labial opening, and a broad band of adhesive plaster was passed around the patient's hips to immobilize the pelvis. When put in bed the patient was placed upon a Bradford frame. The frame was uncovered for twelve or fifteen inches, so that the patient could be kept clean without difficulty. She was encouraged to move upon the frame as soon as she felt inclined, and usually began to lie upon the side within a few days after operation.

The puerperal period was normal in only 6 cases; in the other 7 the temperature varied between 100.5° and 102.5°; 2 patients had considerable distention, but none had serious infection.

One patient got out of bed on the fourth day without injury to herself. With one exception, the patients were allowed to get up between the sixteenth and twenty-third days. On the average, they got up on the twentieth and left the hospital on the thirtieth day. When discharged most of them walked without difficulty, and a few with a slight limp, which soon disappeared. Ten of the patients were seen later and

¹ American Journal of Obstetrics, August, 1908.

reported themselves perfectly well in every respect and able to work as hard as before the operation.

In more than one-half of the cases, there was callus upon the anterior surface of the pubic bone. The posterior surface was smooth, and occasionally a slight notch upon the upper and lower margins of the bone, corresponding to the ends of the incision, could be felt by vaginal examination. There was no bony union, and in four cases the cut ends of the bone could be felt to move upon each other. In one case the sacroiliac joints were damaged, but this injury had disappeared one month later. No change could be found in the pelvis after operation, except in one case of funnel-shaped pelvis, where the distance between the tuberosities of the ischia had increased from 7 to 8 cm. (2.8 to 3.2 in.). In all cases there was edema of the vulva upon the side of operation, and pronounced in 3; in two cases hematocele occurred with induration; one case had slight phlebitis in the left leg; one had stitch infection in the upper pubiotomy wound; in three the prolonged use of the catheter was necessary.

One child was born asphyxiated after an easy and rapid breech extraction, and was not resuscitated. In one case, after a comparatively easy delivery, the head was markedly moulded, the child apparently dying of birth pressure. In the third case, labor had lasted sixty-one hours; in the second stage, ten hours.

Three of these patients have become pregnant since the operation, and one was delivered spontaneously at her own home, the child weighing seven pounds, with a biparietal diameter of 8.5 cm. (3.4 in.). The conjugata vera measured 7 cm. (2.8 in.), and it is doubtful whether the favorable outcome was due to a readily moulded head or to some enlargement of the pelvis. Another patient has been pregnant twice, the first terminating in spontaneous premature labor at the seventh month. This patient was again pregnant when the paper was written, as was also a third.

Doederlein's method, which was used in all but the third case, consists in separating the soft parts from the posterior surface of the pubic bone by the finger introduced through a small incision parallel to the upper margin of the pubic arch, and median to the pubic spine. The bladder is thus protected, and the incision is so small as to be of no practical importance. A curved needle is then passed beneath the bone through the labium majus. This method was satisfactory.

Williams believes it to be of great importance that the vaginal outlet be widely dilated before beginning the operation. This is done under complete anesthesia, by the gloved hand folded in the shape of a cone and well lubricated, passed slowly into the vagina, which is gradually dilated until it readily admits the closed fist, and after that still further dilated by the fingers of both hands placed back to back. By this means, the degree of dilatation is obtained in a few minutes nearly comparable to that effected by the head of the child.

Williams believes that pubiotomy will eventually supersede the induction of labor in moderate degrees of pelvic contraction. But 5 or 6 per cent. of these patients require operation, while the induction of labor would probably be employed in from 25 to 30 per cent. of these cases.

The fetal mortality in induction of labor is very much greater than that after pubiotomy. The maternal mortality of pubiotomy is less than 2 per cent. Pubiotomy is less dangerous with modern technique for mother and child than symphysiotomy.

The results of Cesarean section performed early in labor give a maternal mortality of 1.2 per cent., with no mortality for the children.

Williams believes that where engagement does not occur, the best interests of mother and child would be served by performing Cesarean section, if possible, a few days before active labor, or in the earliest stages of labor. It is possible to make the choice of operation most accurately in multiparæ, where one has the history of a previous labor as a guide.

Cesarean section late in labor is more dangerous than pubiotomy. The operation enters into competition with high forceps, prophylactic version, and craniotomy, rather than with Cesarean section. To obtain good results, it must be regarded as a primary operation, whose dangers are infection, deep tears, and hemorrhage, and should not be resorted to after the failure of high forceps or version. When these have failed, craniotomy should be chosen. It should not be employed in infected patients. It is an operation for experienced operators only, who can command good hospital facilities.

THE PELVIS AFTER HEBOTOMY. Christofletti¹ examined the pelvis in two cases, the patient dying some time after the performance of pubiotomy. In one case, the diagonal conjugate was 9.5 cm. (3.8 in.). After the pelvis was opened the child was extracted by forceps, the patient making a good recovery.

In a succeeding pregnancy the patient was delivered by version, of a child which survived, but died sixteen days afterward from septic infection.

On examining the pelvis, a callus containing considerable bony tissue was found projecting upon the interior surface of the pelvis. Injury in the levator ani muscle, upon the side operated upon, was also found. There was a slight increase in the distance between the symphysis and the iliopectineal tubercle in favor of the side of operation. The half of the pelvis on which the operation was done seemed to be larger than the other.

The second case had a flat rachitic pelvis with a true conjugate of 8 cm. (3.2 in.). After pubiotomy, the child was delivered by forceps

¹ Zentralblatt f. Gynäkologie, 1908, No. 14.

and the bladder was wounded. Six months afterward the patient had hernia at the site of operation, and wore a truss. She could walk without difficulty. About a year after operation she committed suicide. There was no bony union between the cut surfaces of the bones, but fibrous union only. There was slight enlargement of the pelvis on the side of operation.

In both cases the entire pelvic ring was somewhat enlarged. The presence of callus on the internal surface had slightly contracted one of the pelvises. Hernia at the site of operation was a most annoying complication.

In the discussion, Bürger stated that he had examined 25 patients in Schauta's clinic upon whom the operation had been done. The patients were in good condition and the pelvis permanently enlarged; in some cases the conjugata vera being increased 1 cm. (0.4 in.); in 3 cases, birth had occurred after operation, the children evidently having been smaller than when the operation was performed. Union occurs in these cases in different ways, with different patients.

By the use of the *x*-ray, he found that in most cases union was fibrous only and very rarely bony.

Schauta would carefully limit the indications for the performance of pubiotomy. There is danger that the operation will be undertaken too soon, without waiting sufficiently long for spontaneous birth. In the majority of cases, labor should be terminated as soon as the pelvis is open. In two recent cases, however, Schauta opened the pelvis and allowed spontaneous labor to occur within two hours afterward.

PERMANENT ENLARGEMENT OF THE CONTRACTED PELVIS. Schickele¹ has devised a method by which he hopes to accomplish permanent enlargement of contracted pelvis of sufficient degree to enable spontaneous labor to subsequently occur. In place of the usual pubiotomy, he makes an incision into the bone about one-third of its thickness, then incises the bone laterally for a considerable distance, then brings the saw out upon the opposite surface.

The purpose of this operation is to avoid bony union, which leaves the pelvis but little enlarged, and to substitute a fibrous union of considerable extent, which shall provide considerable pelvic enlargement.

PUBIOTOMY IN A MODERATELY CONTRACTED PELVIS. Sigwart² performed pubiotomy upon a multipara having a diagonal conjugate of 10.5 cm. (4.2 in.). She had seven spontaneous births. In the eighth labor very considerable disproportion between the head and the pelvis existed. While preparations for pubiotomy were being made, the uterus ruptured and the patient was delivered by abdominal section. She recovered.

The second case had an external conjugate of 18 cm. (7.2 in.), and an

¹ Zentralblatt f. Gynäkologie, 1908, No. 17.

² Ibid., No. 48.

internal conjugate of 10.5 cm. (4.2 in.). The position was the second. Eighteen hours after the beginning of labor, engagement and descent failing, pubiotomy was performed and the child extracted with forceps. It was deeply asphyxiated, but was resuscitated. Both mother and child recovered.

The head of the child was extraordinarily hard, with an enormous caput succedaneum. The biparietal diameter was $11\frac{3}{4}$ cm. (4.7 in.). The weight of the child was 4200 grams (8 pounds).

LABOR AFTER PUBIOTOMY. Toth¹ reports four cases of pubiotomy in which there was nothing of unusual interest. One of the children was lost through birth pressure.

He also reports the case of a patient who had previously been delivered by pubiotomy. The external conjugate was 18 cm. (7.2 in.), the internal 9.5 to $9\frac{3}{4}$ cm. (3.8 to 3.9 in.). Under strong pains, the head engaged in the entrance to the pelvis, but did not descend. Under traction with the forceps, the head descended, and the tissues at the site of the former pubiotomy could be distinctly felt by the finger to separate very considerably. The child survived and the mother recovered.

INDICATIONS FOR PUBIOTOMY. Bumm² reports the case of a multipara upon whom pubiotomy was performed by the subcutaneous method with the curved needle. The patient's convalescence was retarded by peritoneal irritation, caused by injury to the lower portion of the uterus, by hematoma of the left labium, and wound of the bladder.

He has had in his clinic fifty-two pubiotomies after the subcutaneous method, with one fatal result from embolic pneumonia. Hemorrhage and severe lacerations have been practically prevented. He would limit the operation to the lesser grades of pelvic contraction.

Ferroni³ reports five cases of pubiotomy after Gigli's method.

Jardine⁴ operated by Doederlein's method upon a primipara, aged twenty-nine years, on whom forceps had been tried without success. The diagonal conjugate of the pelvis was four inches. The disproportion between the head and the pelvis was considerable. Cesarean section would have been chosen had not the forceps been previously applied. After the pelvis was opened the patient was delivered by the forceps in Walcher's position. The ends of the bones separated about an inch, and the anterior wall of the vagina was lacerated to the bladder and urethra. The perineum was also torn. The perineal wound was closed, and the skin wound sutured with silkworm gut. The vaginal wounds were not stitched, but were drained with iodoform gauze; adhesive plaster and a binder were placed around the pelvis; sand bags were used in addition.

The patient's recovery was complicated by a vesicovaginal fistula, by sloughing in the vagina, and by necrosis of the cut ends of the bone.

¹ Zentralblatt f. Gynäkologie, 1908, No. 49.

² Ibid., No. 19.

³ Annali di Ostetricia e Ginecologia, 1908, No. 2.

⁴ Journal of Obstetrics and Gynecology of the British Empire, March, 1908.

The patient had considerable cystitis. The fistula was repaired by operation, but with great difficulty, as it was so high in the narrow channel from which the bone had been removed that it could scarcely be reached. The fistula finally closed.

The patient was discharged in about three months from the time of admission, with firm fibrous union of the pelvis, and was able to walk quite comfortably.

Jardine's opinion regarding symphysiotomy and pubiotomy, based upon his experience, is not a favorable one.

His unfavorable opinion is shared by Peham, who reviews the literature of the subject in answer to an article strongly commending the operation, published by Bumm.

Peham believes that if the lives of mother and child are to be saved that Cesarean section is by far the safer operation.

Ehrlich¹ operated upon a primipara, aged twenty-four years, who had a symmetrically contracted pelvis with an external conjugate of 17 cm. (6.8 in.). The symphysis was 5 cm. (2 in.) high and the true conjugate 7 cm. (2.8 in.). Doederlein's method was employed; the pelvis was opened and the patient put in bed, with the hope that the head would engage and possibly be delivered spontaneously. The use of the catheter showed that the bladder was uninjured. Spontaneous delivery failed, and the heart sounds of the child grew faint and slow. Breus' axis traction forceps was applied and the head brought down without much difficulty, the pelvis separating the width of four fingers. The child was asphyxiated, but revived. The mother's recovery was complicated by hematoma in the left labium and at the point of incision. The hematoma was incised, its contents removed, and Bier's method employed. The patient was able to move about in seventeen days after the operation.

Oberndorfer² publishes a paper giving the result of an autopsy upon a woman who died fourteen months after pubiotomy from an intercurrent infection. His paper is illustrated by radiograms and by illustrations of microscopic sections. There was not the slightest evidence of bony union, nor would this have developed had the patient lived, as the histological elements necessary for the production of bone were entirely lacking.

DISTURBANCES IN LOCOMOTION FOLLOWING PUBIOTOMY. Neu³ reports from the clinic at Heidelberg, the case of a primipara, aged twenty-three years, with rachitic pelvis and a diagonal conjugate of $9\frac{3}{4}$ cm. (3.9 in.). Pubiotomy upon the left side was performed after Doederlein's method. The pelvis separated 3 cm. (1.2 in.), while the head was carried into the pelvis by pressure. The head was delivered

¹ Zentralblatt f. Gynäkologie, 1908, No. 20.

² Ibid., No. 7.

³ Monatsschrift f. Geburtshülfe und Gynäkologie, 1908, Band xxvii, Heft 4.

by manipulation aided by the mother's efforts. The child was born in pallid asphyxiation and could not be revived.

During the puerperal period the patient developed an acute inflammatory process in the right sacro-iliac joint with perineuritis of the sacral plexus, pain in the lower extremities, and altered sensation. The Röntgen rays showed some enlargement of the pelvis following its excessive dilatation. The right sacro-iliac joint seemed especially involved. The patient's convalescence was considerably delayed by pelvic pain, but she finally regained good motion.

Further examination with the Röntgen rays showed the contour of the pelvis considerably altered. During the patient's convalescence she suffered from acute cholecystitis and from neuralgic symptoms in the right pelvic nerves. Similar cases are collected from the literature.

The results of the operation were not satisfactory to the operator.

Lerda¹ has endeavored to bring about a permanent enlargement of the pelvis after pubiotomy by an osteoplastic resection of the ramus of the pubis. By a transverse incision bony flaps are loosened and joined in such a manner as to permit the permanent enlargement of the pelvis. His incision is made obliquely in such a way as to permit considerable separation without permanent union. He reports no operation upon the living; the experiments upon the cadaver indicate an enlargement of nearly 2 cm. (0.8 in.) in several of the pelvic diameters.

Jeannin and Cathala² report three cases from Tarnier's clinic in Paris. The cases terminated favorably for the mothers; one of the infants had symptoms of meningeal hemorrhage relieved by lumbar puncture.

The writers review the literature of the subject, quoting extensively from the results obtained in German clinics, showing a maternal mortality of between 5 and 7 per cent. The superiority of the subcutaneous method seems demonstrated by Rossier's collection of 300 cases, giving a maternal mortality of 4.2 per cent., in contrast with 10 per cent. mortality in the open method.

By comparison with symphysiotomy, the writers believe that pubiotomy is attended with fewer complications. They tabulate 39 cases by French operators, giving favorable results for the mothers, but with a high rate of morbidity in the puerperal state. They conclude that pubiotomy is more satisfactory than symphysiotomy. They would, however, prefer Cesarean section in women uninfected at the time of labor. Where, however, signs of infection are already present, they prefer pubiotomy with drainage of the wound of operation.

SEVEN HUNDRED HEBOSTIOTOMIES. Schläfli³ reports eight hebostiotomies in von Herff's clinic, in Basle, and in all has collected and examined the results in 700 cases.

¹ Zentralblatt f. Gynäkologie, 1908, No. 1.

² L'Obstétrique, October, 1908.

³ Zeitschrift f. Geburtshilfe und Gynäkologie, 1909, Band lxiv, Heft 1.

In examining the results of the operations done in von Herff's clinic, we find that the true conjugate was not less than 8 cm. (3.2 in.). The indications were threatened rupture of the uterus, danger to the mother and child, and failure in the use of forceps. The mothers recovered. Most of the children were born asphyxiated; one of the children died from septic pneumonia on the eighteenth day.

In each case, the operation was complicated by some considerable degree of hemorrhage; in many by hematoma, injuries to the bladder, lacerations of the vaginal tissue, pain in the sacro-iliac joints, thrombophlebitis, suppuration and necrosis in the pelvic wound, and in one case prolonged fever with pneumonia. In none of the cases was the convalescence an uncomplicated one.

A review of the literature in the 700 cases shows that the complications encountered in von Herff's clinic are common to the operation when performed elsewhere. A general mortality rate for the mothers of 4.82 per cent. is reported. This is but little more favorable than the worst statistics of modern Cesarean section; while for the children, the results of pubiotomy or hebostiotomy are much worse; 9.18 per cent. of the children after a careful analysis of the statistics, perished during or after the operation.

In reviewing the results of the operation in tabulated form, it is found that in 510 cases there was noteworthy hemorrhage immediately following the operation; in 10.98 per cent. the hemorrhage was profuse; in 2.94 per cent., very profuse; in 1.37 per cent., abundant; while the hemorrhage was considerable in 15.3 per cent. In 0.3 of one per cent. notable hemorrhage occurred during the performance of the operation. Hematoma was present in 17.06 per cent., and lacerations communicating with the vagina in 15.49 per cent. This injury is three times as frequent among primiparæ as among multiparæ. Ordinary laceration of the genital tract was observed in 17.84 per cent.

The mortality rate of those patients having lacerations opening into the vagina was 12.66 per cent. These lacerations directly caused death in 31.25 per cent. Laceration of the birth canal caused death in 40.6 per cent.; wounds of the bladder occurred in 12.35 per cent.; fever in the puerperal period in 31.76 per cent.; thrombophlebitis in 8.23 per cent.

Among those patients examined after the operation hernia was found between the cut ends of the bone in 7.5 per cent.; prolapse of the vagina in 24.17 per cent.; and prolonged incontinence of urine in 4.17 per cent.

The most favorable analysis of statistics gives the maternal mortality directly referred to the operation itself as 4.37 per cent. The mortality among the children referred to the operation as 9.6 per cent.; and the general mortality of the children as 9.18 per cent.

It is not strange that the writer concludes that pubiotomy or hebostiotomy is a serious operation, to be undertaken only when the con-

ditions are unfavorable for Cesarean section, and when serious danger threatens the lives of mother and child.

At the present time, this is the most extensive analysis of the subject which has appeared. The literature is extensively and critically examined, and the results must be taken as fairly indicating the present status of the operation.

Cesarean Section. The development of obstetric surgery during the past year has been especially directed to the perfection of Cesarean section. Under this general heading are now included celiohysterotomy, the classic operation perfected by Sänger, which leaves the patient capable of further procreation with lessened risk.

Celiohysterectomy with intraperitoneal treatment of the stump, which terminates the patient's reproductive power, establishes a premature menopause, and by removing the organs leaves the patient free from the probability of ovarian, tubal, or uterine disease. In cases infected at the time of operation the wisdom of following Cesarean delivery by the removal of the uterus is acknowledged, the choice of operation depending largely upon the individual experience and judgment of the operator. He may elect the classic Porro operation, leaving the stump in the lower angle of the abdominal wound; he may remove the uterus entirely by extirpation; or he may attempt to avoid the prolonged convalescence of the Porro operation by dropping the stump.

The most recent attempt at advance in Cesarean section is a revival of an old method which seeks to avoid the opening of the peritoneum. This is especially advocated by Frank and Sellheim, but as yet has not been subjected to the test of wide experience.

In contrast to abdominal Cesarean section, vaginal Cesarean section is by some warmly advocated in the treatment of eclampsia and premature separation of the normally implanted placenta. Cesarean section is also the operation of choice among some for central placenta prævia with unshortened cervix, the mother and child being in good condition.

CELIOHYSTEROTOMY, WITH ESPECIAL REFERENCE TO THE ELECTIVE CESAREAN SECTION. Reynolds¹ collected 289 cases operated upon by twenty different operators. Of these, 82 were primary sections delivered before labor, or with the advent of the first pains, yielding one death, and a maternal mortality of 1.2 per cent. This death was caused by hemorrhage, the uterus having been sutured with catgut, which loosened after the operation; 158 cases are classed as secondary, having been for some time in labor, with a mortality of 3.8 per cent.; 49 cases are classed as late, because they had been for sometime in labor, giving a mortality of 12 per cent.

These statistics, prepared with great care and with critical analysis, emphasize the importance of early operation and its favorable results

¹ Surgery, Gynecology, and Obstetrics, May, 1908.

The writer thinks that the maternal mortality of high forceps and version is probably about equivalent for the mothers to that of the primary Cesarean section, while the most favorable estimate of fetal mortality in these operations is from 20 to 25 per cent. The fetal mortality in primary Cesarean section is practically nil.

Abdominal Cesarean section was successfully performed by Endelmann¹ for cicatricial contraction of the cervical canal following two very difficult induced labors, terminating in the death of the children, the puerperal period being complicated by fever.

Schauta² delivered a patient by Cesarean section whose case was complicated by suppuration of the appendages. It was necessary to perform supravaginal amputation of the uterus with extraperitoneal treatment of the stump. The result was favorable.

He also operated upon another patient having a very large pus sac in the pelvis, removing the child by Cesarean section at the seventh month, closing the uterus, and waiting for a favorable opportunity to drain the pus sac through the vagina. Five days after operation it ruptured into the rectum, with the discharge of half a liter of pus. The patient made a good recovery, and the exudate in the pelvis entirely disappeared.

The results of 100 cases of Cesarean section by seven operators, at the Lying-in Hospital, in New York, are given by Gushee.³ These cases included all types of pelvic contraction, with a maternal mortality of 5 per cent.; one from shock, one from pulmonary embolism, and three from sepsis, having been long in labor in tenement houses.

In these operations, the abdomen was opened above the umbilicus, the uterus was not removed from the abdomen, and hemorrhage was controlled as far as possible by pressure until sutures could be applied.

Kedarneth Das⁴ operated at the Campbell Hospital, Calcutta, upon three Hindoo women. Delivery was impossible from stenosis of the vagina caused by extensive scar tissue from previous difficult labors. These patients were in bad condition, being brought to the hospital as a last resort. One of the cases was complicated by extensive vesicovaginal fistula, which had first to be repaired by extensive operation. When pregnancy occurred after this, the patient was successfully delivered by celiohysterectomy. Two of these mothers recovered, and one died.

Fry⁵ reports 18 abdominal Cesarean sections with the recovery of 17 mothers and 15 children. The mother who died had forceps application unsuccessfully before the section.

Fry compares these results with those obtained by high forceps and version, in favor of early Cesarean section. In the case fatal to the

¹ Zentralblatt f. Gynäkologie, 1908, No. 11.

² Ibid., No. 14.

³ Bulletin of the Lying-in Hospital, 1907, No. 3.

⁴ Journal of Obstetrics and Gynecology of the British Empire, May, 1908.

⁵ American Journal of the Medical Sciences, May, 1908.

mother, forceps had been applied four times before the section was done.

Nijhoff¹ performed Cesarean section successfully for contracted pelvis complicated by lateral placenta prævia. The recovery of mother and child was uncomplicated.

Jardine² advocates Cesarean section in uninjured and uninfected patients early in labor. He also urges the importance of careful examination to determine the relative size of the head and the pelvis.

A. B. Davis³ reports four successful Cesarean sections upon the same patient. As the patient did not request sterilization in the last operation, the uterus was left after careful suture. The results in these four operations for mother and child were entirely satisfactory. There was slightly more than the usual uterine hemorrhage at the third and fourth operation, but this was easily controlled.

Polak and Warren⁴ report respectively 14 and 5 cases of Cesarean section. The results are similar to those already reported by other operators, and emphasizes the good results of prompt operation in uninfected patients.

Lemoussu⁵ reports thirty-eight cases of late Cesarean section. All of these patients had been in labor at least twelve hours. In many the membranes had been ruptured for sometime. This series is remarkable, because many of these patients had other attempts made at delivery, while but one of these mothers died. She perished fourteen days after the operation from an accidental burn.

It has long been recognized that after celiohysterotomy, the uterine cicatrix may rupture, exposing the patient to very considerable danger.

Meyer⁶ reports two cases at Copenhagen, of rupture of the uterine scar after Cesarean section. In each of these the second operation was performed during a subsequent labor, with a successful result for mother and child.

Broadhead⁷ lost a patient by rupture of the uterus through the scar of a Cesarean section, which he had previously performed.

Including his own, he has collected 20 cases, in one of which the result for the mother is not given. In the 19 remaining, the mother recovered in 16, and perished in 3; in 4 of these cases, no statement is given concerning the fate of the children; 3 of the children were saved and 12 were lost.

Allen⁸ urges the importance of the primary Cesarean section, reporting 9 cases, with the recovery of 6 of the mothers and all of the children.

¹ Zentralblatt f. Gynäkologie, 1908, No. 26.

² British Medical Journal, September 19, 1908.

³ Bulletin of the Lying-in Hospital, New York, June, 1908.

⁴ American Journal of Obstetrics, October, 1908.

⁵ Thèse de Paris, January, 1908.

⁶ L'Obstétrique, February, 1908.

⁷ American Journal of Obstetrics, May, 1908.

⁸ Ibid., February, 1909.

One of the fatal cases was infected before operation, and died on the fourth day from streptococcus infection.

The second fatal case had eclampsia, with almost total suppression of urine, twelve hours after operation.

VAGINAL CESAREAN SECTION. The claims of vaginal Cesarean section are urged by Fry¹ in a paper read before the Philadelphia Obstetrical Society, December, 1908, reporting twelve cases.

He believes that the prompt performance of delivery by vaginal Cesarean section will lessen the mortality of eclampsia for the mother 5 per cent. Fry's faith in vaginal Cesarean section is shared by his colleagues in the hospital of which he is chief.

Rotter² reports five cases of vaginal Cesarean section for eclampsia. One mother died with edema of the lungs, acute nephritis, hemorrhage in the liver, and hyperemia of the brain. Her child perished two hours later. The other mothers and children recovered, one of them being a case of twin pregnancy.

Nacke³ performed vaginal Cesarean section in a severe case of eclampsia at eight months pregnancy. The child was dead at the time of operation, but the mother recovered. The operation was not attended by special difficulties.

Nacke also reports the case of a woman who had once been delivered by abdominal Cesarean section with transverse fundal incision. In a subsequent labor the child was extracted in breech presentation, and two hours afterward the mother collapsed. Rupture of the uterus was diagnosed, with prolapse of the intestine into the uterus through the scar of the former operation. Abdominal section was at once performed and the laceration in the uterus closed. The mother made a tedious recovery complicated by pulmonary tuberculosis.

Fuchs⁴ operated upon a patient to repair extensive lacerations in the birth canal, the result of difficult labor. The patient was then a widow. She afterward married, became pregnant, and Fuchs delivered her safely by vaginal Cesarean section.

In a second pregnancy the scar tissue resulting from the two former operations was such and the patient's desire was so urgent that abdominal section was performed, with the removal of the Fallopian tubes. Mother and child made a good recovery.

Peterson⁵ performed vaginal Cesarean section for rigidity of the cervix. A stillborn child was extracted, the mother making a good recovery.

At the time of labor the child was delivered by extraction by the feet, with the use of forceps upon the after-coming head. The perineum

¹ American Journal of Obstetrics, February, 1909.

² Zentralblatt f. Gynäkologie, 1908, No. 49.

³ Ibid., 1909, No. 6.

⁴ Ibid.

⁵ Surgery, Gynecology, and Obstetrics, February, 1909.

was torn through into the rectum, and repaired by a secondary operation. The pelvic measurements were normal, and the dystocia was caused by abnormal rigidity of the cervix. The mother made a good recovery.

He reports a second case performed by Bailey in a private house. The mother had had an abdominal operation for prolapse six years before. The cervix failed to dilate. The child, eight months developed, had been dead for some time. The mother made a good recovery.

Third and fourth vaginal Cesarean sections are reported for eclampsia, with the recovery of the mother. One of these children did not survive the operation long; the other left the hospital in fairly good condition.

A fifth case of acute nephritis was treated by vaginal Cesarean section, with the delivery of a dead child by forceps, the mother recovering.

In a sixth case, the mother was brought to the hospital in eclamptiform convulsions. Vaginal Cesarean section was performed and a living child extracted by version. The mother recovered.

Peterson's article is illustrated by some excellent drawings showing the successive steps of the operation.

SUPRASYPHISEAL OR EXTRAPERITONEAL CESAREAN SECTION. Under this title Frank and Sellheim for several years have urged upon the profession a form of Cesarean section whose primary object is to deliver the child without passing through the pelvis, and also without opening the peritoneum.

While the question of priority is not distinctly raised, the inference is that Frank and Sellheim believe that this idea has practically originated with them. Their method consists under aseptic precautions, in distending the urinary bladder moderately with sterile salt solution to force it upward as far as possible above the suprapubic region. A transverse incision, in accordance with Pfannenstiel's method, is made across the recti muscles just above the pubic bone. The peritoneum is pushed upward and the urinary bladder forward over the pubis. The lower uterine segment is then incised longitudinally, and the child extracted by pressure upon the fundus, forceps, manual delivery, or version. The placenta is then removed, and in many cases the uterus packed with iodoform gauze, which is carried through the cervix into the vagina. The incisions are then closed by catgut.

In discussing this matter with my teaching staff at the Jefferson Medical College, Dr. Newnam drew my attention to a proposal made by Dr. Physick, of Philadelphia, and published by Dewees in his compendious *System of Midwifery*, Philadelphia, 1826.

Dewees states that he had discussed with Horner, Adjunct Professor of Anatomy in the University of Pennsylvania, the possibility of lessening the mortality of Cesarean section by opening the uterus without opening the peritoneum. Horner believed that the peritoneum could be pushed up from the anterior portion of the uterus at the pubis, which is not covered by peritoneum; that distention of the bladder would assist

in raising the peritoneum, and that an incision could possibly be made at this point.

Dewees writes that "Physick proposes that in the Cesarean operation a horizontal section be made of the parietes of the abdomen just above the pubis, that the peritoneum be stripped from the upper fundus of the bladder by dissecting through the connecting cellular substance, which will bring the operation to that portion of the cervix uteri where the peritoneum goes to the bladder. The incision being continued through this portion of the uterus will open its cavity with sufficient freedom for the extraction of the fetus, all of which may be done by a careful operation without cutting through the peritoneum."

Whether the question of priority be raised or not, it is interesting to note that this operation was described eighty years before the present attempt to bring it into common use.

At the last meeting of the British Medical Association, Zweifel reported four extraperitoneal abdominal hysterotomies, with recoveries; three of the women recovered without complications; the fourth had fever before and after operation, but recovered ultimately with the bursting of an abscess.

He urges that the incision through the peritoneum be transverse, and that its edges be united in such a manner as to replace all the organs in their previous position. If this is done, the danger of rupture in future confinements is not greater than after the usual Cesarean section.

Zweifel's experience includes 16 subcutaneous symphysiotomies, without a maternal death; 52 open symphysiotomies, with 3 deaths; 130 celiohysterotomies, abdominal Cesarean section, with a total mortality of 5.3 per cent.

Sellheim¹ describes his method as follows:

Spinal anesthesia with scopolamine morphine. The pelvis is slightly raised, a transverse incision from 15 to 20 cm. (6 to 8 in.) long is made down to the fascia; the small vessels are carefully tied. The fascia is opened transversely, and the two flaps thus formed are closed by stitches and the recti separated longitudinally. The peritoneal and subperitoneal tissue is separated from the inferior surface of the recti muscles. The bladder is moderately distended to outline it plainly. The peritoneum is separated from the bladder with pledgets of gauze, blunt scissors being used in the centre, until the operator comes down upon the cervix. The bladder is then pushed downward as far as possible, an incision made in the median line, the uterus opened, and the child pressed down from above and extracted. The umbilical cord is tied and cut, and an injection of ergotine given. The uterus is allowed to contract and the placenta delivered manually, the uterus and cervix being tamponed with gauze. The incisions are then closed with continuous catgut, and

¹ Zentralblatt f. Gynäkologie, 1908, No. 5.

the pelvis is lowered. The bladder is brought up into its normal position, and a few buried catgut stitches are inserted to bring the fascia back into normal position. The skin is closed by sutures or clamps, and sand bags are placed at the sides of the patient to immobilize her for a short time.

He reports two successful cases, it being noticeable that the child breathed at once upon delivery. The time of operation was about forty minutes. The anesthetic used was stovain with adrenalin. The recovery of the mothers was uninterrupted.

Baumm¹ reports two cases, in both of which the wounds became infected. One mother recovered after a tedious convalescence, with a discharge of pus from necrotic material; the other mother died of peritonitis and the formation of a large pelvic abscess.

Sellheim² reports Cases III, IV, and V, in his experience with this operation. One mother died of streptococcus infection, the entire region of the wound showing infection and suppuration. The child survived. One mother had had abdominal Cesarean section, from which she made a good recovery. She was delivered by extraperitoneal operation, with a good result. The third reported case was complicated by goitre and a heart lesion. The vessels were greatly distended, but the operation presented some unusual difficulties. The cervix was dilated from above with Hegar's dilators. Although the mother's recovery was complicated by bronchopneumonia, her goitre rapidly decreased, and mother and child made good recoveries.

Fromme³ believes in the operation, but would simplify Sellheim's technique. He would not hesitate to open the peritoneum, but would stitch two layers together, using a clamp at the upper border of the incision. After the extraction of the uterine contents the tissues are closed in the usual manner.

Küstner⁴ reports two operations with Sellheim's method; one proceeded normally with uninterrupted recovery of mother and child. The recovery of the second mother was complicated by foul lochia and bronchitis. She and her child ultimately recovered.

Czyzewicz⁵ reports a successful case in which he delivered the child by version.

Schmidt delivered a patient by abdominal Cesarean section successfully, but in a subsequent pregnancy she suffered from abdominal hernia, which threatened to become serious after the emptying of the uterus. She was allowed to go to term and then delivered by the Porro operation successfully.

Luchsinger⁶ operated upon a patient who had been some time in labor with severe pains, delivering a child which died from intracranial

¹ *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1908, Band xxvii, Heft 2.

² *Zentralblatt f. Gynäkologie*, 1908, No. 10.

³ *Ibid.*, No. 17.

⁴ *Ibid.*, No. 16.

⁵ *Ibid.*, No. 25.

⁶ *Ibid.*, No. 33.

hemorrhage and pneumonia the second day after labor. The mother's wound became infected and she made a tedious recovery.

Uthmoller¹ reports in detail a successful case.

Hammerschlag² reports three successful cases; and Kahn reports a case complicated by mild infection developing after the operation. Wiemer³ selected Sellheim's method in a patient who had been delivered by abdominal Cesarean section because the uterus was adherent in the scar of the former operation. The method proved successful.

Doederlein⁴ reports two successful cases without special incident; and Jahreiss⁵ another. Veit,⁶ in a discussion upon the subject, would perform abdominal Cesarean section in clean cases, and suprasymphysal operation in doubtful cases.

Sellheim would reserve the extraperitoneal operation for clean cases only. He had, by abdominal Cesarean section, vaginal Cesarean section, hebostiotomy, and symphysiotomy, operated upon twenty-one cases. The indications for operation were contracted pelvis in 9; placenta prævia in 7; eclampsia in 2; heart disease and goitre in 1; infection in 1; death from virulent meningitis in 1—a total of 21 cases; 17 of these were aseptic at the time of operation; 4 were infected. Of these mothers, 4 died; 2 of eclampsia, 1 from meningitis, and 1 from septic infection. Two of the children died.

Sellheim states that six general methods of performing extraperitoneal section are recognized, each of which he has tried. He naturally prefers his own technique.

It is interesting to note that Ritgen's operation is practically the laparo-elytotomy, performed in one case successfully by Gaillard Thomas.

At the meeting at which this discussion was held, Frank showed a number of cases upon whom the extraperitoneal section had been performed, with transverse incision of the abdominal wall. These patients showed no tendency to hernia, as the tissues were firmly healed and the parts in good condition.

In operating, Sellheim ascertains the condition of the peritoneal cavity by making a small opening through the peritoneum for inspection with exploration of the finger. This opening is readily closed by suture. Sellheim urges that in infected cases, after delivery of the child, an abdominal uterine fistula be formed by uniting the edges of the uterine and abdominal incisions. The uterus is packed with gauze, which is brought out through the fistula. Permanent drainage is thus secured, with conditions most favorable for recovery.

Kroemer⁷ reports 9 operations, 7 of which were performed by Sell-

¹ Zentralblatt f. Gynäkologie, 1908, No. 45.

² Ibid., No. 50.

³ Ibid., No. 39.

⁴ Ibid., 1909, No. 4.

⁵ Ibid., No. 7.

⁶ Monatsschrift f. Geburtshilfe und Gynäkologie, 1908, Band xxviii, Heft 5.

⁷ Münchener med. Wochenschrift, 1908, No. 42.

heim's first method, entirely extraperitoneal. In 2, Sellheim's flap method with transverse peritoneal section was employed. In the former cases the child was extracted with forceps; in the latter, by version. One mother died in eclamptic coma, and the children all survived.

The best time to operate is when the cervix is fully dilated, the patient being uninfected. Kroemer inclines to the belief that whenever possible pubiotomy followed by spontaneous labor should be attempted.

CESAREAN SECTION WITH TWINS AND PLACENTA PRÆVIA. Jardine¹ operated successfully by abdominal Cesarean section on a patient who had already been delivered by this method because of contracted pelvis. In the present operation twin pregnancy was found. At the patient's request, a portion of the Fallopian tubes was removed. There were two placentæ, one of them being prævia.

CESAREAN SECTION AND TOTAL HYSTERECTOMY. Spencer² delivered a patient who had a firm fixed uterine tumor the size of a fist, complicated by pregnancy. The child was dead, but could not safely be extracted through the vagina. The uterus was retroflexed and the tumor adherent. After amputating the uterus, the entire uterus and tumor were successfully removed.

Two interesting and valuable articles upon Cesarean section, its indications, different methods, and results, are published by Küstner³ and von Franqué.⁴

Küstner does full justice to Frank and Sellheim and others who are endeavoring to perfect the extraperitoneal Cesarean section. He reserves a positive decision in the matter, but gives the various points suggested by his experience in 104 Cesarean sections, of which 6 were performed upon the dying. The paper covers in an interesting manner the entire field and will repay careful reading. Its conclusions are in the line of the points already stated.

Among the curiosities in Küstner's experience is a Cesarean section performed at the Zoölogical Gardens in Breslau upon an ape. The fetus was unfortunately dead, showing the effects of birth pressure before operation. The heart sounds had ceased before the operation was begun. The placenta was situated upon the posterior wall of the uterus and was readily delivered. The uterus was closed with catgut and the abdominal wound in two layers. A strong permanent bandage was placed upon the abdomen. Following operation the animal had a prolonged chill. The stitches were removed fourteen days after the operation with primary union. The animal subsequently passed through a successful pregnancy and parturition.

Von Frank reports a case of extraperitoneal section in which the

¹ Journal of Obstetrics and Gynecology of the British Empire, December, 1908.

² Ibid.

³ Zeitschrift f. Geburtshülfe und Gynäkologie, 1908, Band lxxiii, Heft 3.

⁴ Ibid., Band lxxiii, Heft 1.

mother's recovery was complicated by infiltration in the pelvic tissues, with fever. She ultimately did well.

In a second case, the mother was evidently infected at the time of operation. The child was delivered by abdominal Cesarean section, a compress soaked in alcohol placed in the uterus, the uterine wall hastily closed, and the uterus completely extirpated. Mother and child made a good recovery.

He also reports a fatal case of pubiotomy in which the patient had been discharged, apparently doing well, with thickening in the tissues surrounding the site of operation. A few days afterward she was taken with symptoms of pulmonary embolism, and was again admitted to the hospital, where she died. Upon autopsy, the pelvic tissue at the site of the pubiotomy had not united. There was in the median line a large vesicovaginal fistula and the uterus was retroverted; there was an exudate in the pelvic tissues and beneath the peritoneum of the anterior abdominal wall. Thrombosis was present in the common iliac vein, external iliac, and left femoral. The left inguinal glands were enlarged; there was recent and old pulmonary embolism upon both sides; there was multiple hemorrhagic infarction of both lower lobes of the lung; there were changes in the liver, and gallstones in the gall-bladder.

He also reports the case of a patient who had had difficult labors, with pubiotomy, from which she made a good recovery.

In a succeeding pregnancy it was found that operation would be necessary, and accordingly the pelvis was opened upon the right side, the first operation having been upon the left. The wounds were closed and spontaneous labor was awaited. After two hours of strong pains the patient was put in Walcher's position and delivered with the occiput posteriorly, without laceration of the perineum and vagina. She made a good recovery, with mobility in the pelvis at the site of operation.

The Induction of Labor in Contracted Pelvis. One of the most interesting and comprehensive monographs upon this important subject is that of Bürger.¹ He utilizes the material presenting itself during the last fifteen years in Schauta's clinic. There were 49,397 cases of labor, among which occurred 5288 contracted pelvises. These were divided into four classes:

(1) Those with conjugata vera from 10 to 9.6 cm. (4 to 3.84 in.); (2) with conjugata vera from 9.5 to 8.6 cm. (3.8 to 3.4 in.); (3) with conjugata vera from 8.5 to 7.6 cm. (3.4 to 3.1 in.); (4) with conjugata vera from 7.5 to 6.5 cm. (3 to 2.6 in.).

Simple flat and symmetrically contracted pelvises are arranged in a separate group, and atypical and rare forms of pelvic contraction are also classed together.

If the four groups first mentioned are taken together, they constitute

¹ Wien, 1908.

10.4 per cent. of all pelves examined, and if from these are subtracted the flat and symmetrically contracted pelves, the remaining constitute 8.5 per cent. of the entire material. The relative frequency of simple flat and symmetrically contracted to the rarer forms of pelvic deformity is expressed by the proportion of 50.8 per cent. to 4.91 per cent. The relative number of primiparæ and multiparæ is placed at 41 and 59 per cent. respectively.

Spontaneous labor occurred in 77.8 per cent., the symmetrically contracted pelvis giving a better prognosis for spontaneous birth than the simple flat.

The maternal mortality in spontaneous birth in contracted pelvis is a very low one from the clinical standpoint, amounting to 0.04 of one per cent.; the fetal mortality in spontaneous birth in contracted pelvis is 2.2 per cent.

As regards the results obtained by various operations when conducted under the best conditions, the carefully chosen use of forceps in contracted pelvis was without maternal mortality. The morbidity in the puerperal period was 12 per cent. The proper use of forceps in contracted pelvis had a mortality for the children of 11.6 per cent.

When patients with contracted pelves were delivered by version in carefully selected cases, the maternal mortality was 0.5 per cent., with 9 per cent. morbidity in the puerperal period. The mortality for the children, however, rose to 71.4 per cent.

In breech presentation occurring in contracted pelvis there was one maternal death, which occurred after the induction of labor. The maternal morbidity in these cases was 6 per cent., and the fetal mortality 50 per cent. Craniotomy and decapitation gave a maternal mortality of 6 per cent., with a morbidity of 30 per cent.

When version was undertaken as a prophylactic measure in contracted pelvis, the maternal mortality was 1.05 per cent.; with a morbidity of 11.5 per cent.; the fetal mortality was 20 per cent.

In thirty-four cases of induced labor completed by prophylactic version, the maternal mortality was 1.9 per cent.; the fetal mortality 47 per cent. If prophylactic version and induction of labor be reckoned together, the combined mortality was 1.3 per cent., the fetal mortality, 27.8 per cent., with 10 per cent. morbidity during the puerperal period. When induced labor was terminated by the high application of forceps the maternal mortality was 1.3 per cent., with a fetal mortality of 38.5 per cent.

Cesarean section for the relative indications gave a general maternal mortality ranging from 3.4 per cent. to 2.5 per cent., with a fetal mortality of but 1.7 per cent. Where cases of contracted pelves were delivered by operations opening the pelvis, there was no direct maternal mortality, with a fetal mortality of 4.3 per cent.

Craniotomy upon the living child gave one maternal death, and 7.8

per cent. puerperal morbidity. When the relative Cesarean section, pelvic section, and craniotomy upon the living are reckoned together, the general maternal mortality was 0.45 per cent., which was reduced in cases conducted in the clinic to 0.22 per cent.

The general mortality of these three procedures in all cases treated was reckoned at 5.66 per cent., with a fetal mortality of 10.7 per cent.

The conclusion of this statistical study seems to be, as stated by the author of the book, that in contracted pelvis one should await spontaneous birth in all cases where the relative size of mother and child gives reasonable ground to believe that this can occur. The induction of labor and the high application of forceps in contracted pelvis were not looked upon favorably. Where spontaneous birth fails, the best results are obtained by the relative Cesarean section and subcutaneous pubiotomy.

THE PUERPERAL PERIOD.

Early Rising in the Puerperal Period. Alvensleben¹ reports the results of 100 cases in Pfannenstiel's clinic, where the mother was encouraged to leave her bed early in the puerperal period.

The first cases chosen were those of primiparæ whose labors had been normal. The results in these patients were so good that the same method was then tried with multiparæ, and those where the least complicated obstetrical operations, as low forceps and version, had been performed. Hemorrhage during delivery of the placenta was not considered a contra-indication. Septic or gonorrheal infection, difficult labor terminated by operation, with extensive lacerations, prolonged labor with bruising and swelling of the birth canal, extensive laceration of the perineum, were considered contra-indications.

The first four days of the puerperal period was considered the time in which early rising from the recumbent posture should be attempted. If the patient was weak before labor, and seemed to require rest, she was up on the third or fourth day; if she was vigorous, on the first day after labor. No patient was urged to get up if she did not wish to do so, and her own inclinations were consulted in each case.

The usual aseptic care of the genital tract and the breasts was thoroughly carried out in all cases. As the patient's strength improved she was given certain gymnastic exercises in addition. These consisted in raising from the bed without assistance, in motions of resistance to the lower extremities adapted to develop the muscles of the pelvis and pelvic floor. Flexion of the trunk was also used. These exercises were never urged upon patients, but were always conducted under careful supervision.

When patients first left the bed they sat up in a comfortable chair

¹ Zentralblatt f. Gynäkologie, 1908, No. 36.

from one-half to one hour, took a few steps, and then returned to bed. The following day they sat up an hour in the morning and an hour in the afternoon, and walked about the room, remaining out of bed in all, on the fifth day, six hours. After the mid-day meal the patients were kept in bed two or three hours. When out of bed, the patients wore a firm linen abdominal bandage with a firm occlusion vaginal dressing.

The 100 patients comprised 43 primiparæ and 57 multiparæ. Of these, 3 got up on the first day, 61 on the second, 19 on the third, and 18 on the fourth day. Among the 100, 90 made uninterrupted recoveries; 6 of these patients, after getting up for the first time, were obliged to remain in bed for several days afterward; 3 from general weakness, 1 from the persistence of bloody lochia, 1 from irregularities and weakness of the pulse, with faintness from myocarditis, and 1 because of pain in varicose veins in the thighs.

In these cases, no symptom of thrombosis developed. In none of these cases was there any serious complication, and the patients were discharged in 3 cases on the eleventh day, 1 each on the fifteenth, seventeenth, and nineteenth days.

Fever occurred in 10 of these patients. The temperature did not rise above 103°, and subsided within three days; in 7 cases there was an offensive lochial discharge, 2 of these patients having cystitis during labor. In 2 cases there were symptoms of mastitis which disappeared without interrupting lactation. One case had an attack of angina.

These patients were discharged from the hospital in from thirteen to twenty-four days.

The morbidity among these patients was 10 per cent.; the general morbidity of the clinic was 17 per cent. This arose largely from overcrowding, as the patients were in the clinic so short a time before labor that prophylactic measures in the care of the breasts and the disinfection of the birth canal in suspected cases could not be properly carried out. There were also a very considerable number of cases of gonorrhea and syphilis among those confined in the clinic, and 50 per cent. of these had elevation of temperature during the puerperal period.

The comparative morbidity of those patients getting up early, and the general morbidity of the clinic, is in favor of early rising. Those who were in the clinic long enough to have preliminary treatment had a morbidity of 7.2 per cent., and those admitted in labor 10 per cent. All of these cases were gotten out of bed early. In patients admitted in labor and allowed to get up later, those who had preparatory treatment had a morbidity of 13.3 per cent., and those who had not, 21 per cent.

The results would indicate that patients in good condition do better when they assume the reclining or upright posture within the first four days of the puerperal period.

As regards involution, the lochial discharge in those getting up early

was increased during the first day, but afterward rapidly lessened. The lochia alba appeared in from four to six days after labor, and by the tenth day most of the cases had no lochial discharge whatever. Involution of the generative tract was notably hastened in those patients having relaxed abdominal muscles. In 9 cases there were symptoms of prolapse; 8 of these were multiparæ, and the ninth, a weak primipara with general enteroptosis. The abdominal muscles became strong and firm in 87 of the 100; of the remaining 13, 11 were multiparæ, 1 a weak primipara, aged sixteen years, and 1 a weak primipara with enteroptosis.

In these cases the uterus by the tenth day was the size of a small fist and anteflexed in most patients. In 84 cases the combined examination of the uterus and surrounding tissues showed a satisfactory condition of involution. In 6 patients retroversion developed—5 multiparæ, and 1 primipara.

The writer believes that the upright posture is best adapted for the replacement of the uterus in its normal position and the prompt involution of the generative tract.

The general health of the patients getting up early is remarkably good. There was improvement in appetite, digestion, respiration; the use of the catheter was unnecessary, and the patients speedily walked in a normal and vigorous manner. By the eighth day it was difficult to detect any signs of the previous confinement.

Two cases grew faint when they first got up; one was a weak patient who had lost 1500 grams of blood during the delivery of the placenta; the other patient had attacks of fainting during pregnancy, for which no cause could be found. The blood pressure was examined in these patients, and it could not be demonstrated that the early getting up had influenced the blood pressure in an unsatisfactory manner. At first the pressure dropped 10 to 20 millimeters of mercury, and the pulse rate rose from sixteen to twenty-four beats to the minute. The diastolic pressure was often unchanged, or at most lessened by 5 millimeters. A short time after getting up the blood pressure and pulse became normal. The conditions were not favorable for the development of thrombosis.

The writer believes that a distinction must be made between early getting up and the early resumption of hard work. The latter is responsible for many cases of prolapse of the abdominal wall and genital organs and displacement of the pelvic viscera. Patients must be cautioned not to strain and bear down. In general practice patients must not be allowed to get up who cannot be trusted not to resume their usual household labors. Such cases must be carefully watched by a doctor or midwife, and the slightest symptoms of bad results must be promptly detected and the cause removed.

Martin,¹ in 100 cases in the Charité clinic in Berlin, tried the effect

¹ *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1908, Band xxvii, Heft 2.

of having patients leave their beds early in the puerperal period. Only normal cases were selected and those in which no pathological condition in any organ could be detected. Great care was taken that these patients did not work or move about actively, but that their getting up consisted in changing the position of the body and in sitting quietly with a firm bandage upon the abdomen. They were allowed to go about very little and to do nothing at all difficult with the hands. They got up first from fifteen to twenty-four hours after labor. In the first seven days they were up two hours in the forenoon, and two hours in the afternoon. If the pulse or temperature rose, or if the patients grew faint, they were immediately put in bed. Where gonococci were found in the uterine secretion they were kept longer in bed, and were not allowed to get up until the pulse and temperature were normal. Of the 100 cases, there were 62 primiparæ and 38 multiparæ. The lochial discharge changed to lochia alba in a few days after the patients began to get up. In 12 cases infection developed in the first seven days; one of these had gonococci in the uterine secretion; the remainder, streptococci, staphylococci, or diplococci. In one case the pulse rose on the sixth and seventh days, with a low temperature. It remained at 100 to 120 for two days, then dropped to normal. In but one case was there fever about 102° , and in no case did any elevation of temperature last for more than two days. The morbidity was 13 per cent.

The uterus was examined daily in these cases, and involution proceeded with unaccustomed rapidity. The functions of the bowels and bladder improved greatly, and cathartic medicines and the catheter were not required. No influence upon the patients' powers to nurse the children could be detected. The younger patients improved very rapidly, and none of them felt faint upon getting up.

The general results of this procedure are shown in a comparison with the morbidity of 1000 cases treated by longer rest in bed. In this series, a morbidity of 18.5 per cent. is contrasted with a morbidity of 13 per cent. in those getting up early. In no case did thrombosis or embolism develop.

Caution, however, must always be observed to select for this treatment only those patients in whom infection can be absolutely excluded, and who are under the immediate care of a reliable physician.

Puerperal Septic Infection. Krönig and Pankow¹ call attention to the importance of cultivating streptococci obtained in the lochial discharges upon agar in making a positive diagnosis of streptococcus infection. The recognition of streptococci in the lochial discharge when cultivated by other media is of little importance. The relative number of streptococci is a factor of moment, and also the culture medium employed.

¹ Zentralblatt f. Gynäkologie, 1909, No. 5.

Heynemann¹ draws attention to the importance of determining the virulence of streptococci by the hemolytic test. For this purpose not only must the lochial discharge be examined, but also the blood. This cannot be done by laboratory research alone, but the blood test must be made at the bedside of the patient. The detection of streptococci and the recognition of their virulence by the lesions which they produce in the blood give the best grounds for a favorable or unfavorable prognosis. They report eighteen cases where streptococci were found in the lochial secretion, but where the blood was free from bacteria. These patients recovered without serious complications.

They also report four cases in which the blood was free from streptococci and in which the streptococci found in the lochial secretion in pure culture had no effect upon the blood. These patients recovered.

A further series of eight cases is reported in which streptococci having no hemolytic activity were found in the uterus in abundance, but not in pure culture. There was no mortality among these.

Fromme² contributes a paper upon the clinical and bacteriological study of puerperal septic infection. He examined 100 apparently normal pregnant patients, finding streptococci in the vagina in 27 per cent. In none of these patients were typical hemolytic streptococci detected. In 36 normal puerperal patients, streptococci were found in the vulva and vagina in 19. These patients had no fever, and the streptococci had no hemolytic power.

While these studies were in progress, Gonnet published a paper giving practically identical results. Both investigators found that streptococci are present in the vagina in many cases normally during pregnancy and the puerperal period without occasioning symptoms, but that the streptococci are without hemolytic power.

Fourteen cases were then examined of patients having fever during the puerperal period. In these cases the streptococci had distinct hemolytic power. In sapremia, examination showed the blood sterile and the streptococci without hemolytic power. In streptococcus endometritis, the germs were in their most virulent condition; the prognosis was doubtful and especially bad where streptococci were found in the blood.

Ten cases are reported in which streptococcus infection became severe, and in which the blood became involved. When hemolytic streptococci are recognized in the genital tract the progress of the case can best be watched by repeated examination of the blood. In puerperal peritonitis and sepsis the streptococci are plainly hemolytic. Their presence in the blood renders the prognosis doubtful, and if they persist and grow in the blood the prognosis becomes hopeless. It seems probable that by introducing antitoxic streptococcic serum this process

¹ Archiv f. Gynäkologie, 1908, Band lxxxvi, Heft 1.

² Ibid., Band lxxxv, Heft 1.

may ultimately be checked. The result of such injections is not the immediate disappearance of the streptococci from the blood, but the neutralizing of the toxemia through repeated doses. Streptococcus peritonitis in the present state of our knowledge must be considered hopeless. Occasionally, by early incision and drainage, a few cases are saved. The diagnosis must be made by watching the invasion and growth of streptococci in the blood.

Fromme concludes that fever in the puerperal period, where any variety of saprophytes are detected in the uterus, and the blood remains sterile, gives an absolutely favorable prognosis. When streptococci are present, the prognosis depends largely upon the hemolytic activity of the germs. Daily examination of the blood should be practised, together with a clinical examination of the abdomen. Peritonitis may develop where the blood remains sterile, and these cases are difficult to diagnosticate.

Important knowledge as regards prognosis and treatment may be obtained by the method described.

Henkel¹ contributes a paper upon the etiology of puerperal wound infection. He divides his cases into three principal groups:

The first comprised 15 cases; those having no vaginal examination, with spontaneous labor, getting up from the fourth to the eighth day, and in 14 out of 15 afebrile convalescence.

One of these patients gave birth to a macerated fetus; one had a flat pelvis, one defective involution, and one suffered from angina; in 8 the lochia contained bacteria; in 7 the vagina was sterile.

The second group of cases comprised thirty-six of spontaneous labor who had vaginal examinations, and in whom external disinfection was not practised. In these various complications occurred, with fever in a considerable number. In the lochial secretion various sorts of bacteria were found in more than half the cases.

The third group comprised 17 cases delivered by operation, in whom disinfection of the vagina was practised. In but two of these cases were no pathological germs found in the lochia.

The result of his observations is to show that auto-infection, in the general sense of the term, does not occur. Microorganisms are carried from without inward in all cases of puerperal infection. While the hands and instruments of the operator may be sterile, manipulation carries bacteria from the vulva and vagina into the cervix. Vaginal disinfection is of little value because of the danger of carrying vaginal secretions into the uterus.

There is no question regarding the presence of streptococci in the lochial secretion of patients having a normal puerperal period. Their presence in the uterus, however, may cause them to assume actively virulent properties.

¹ Zeitschrift f. Geburtshilfe und Gynäkologie, 1908, Band lxxiii, Heft 1.

Henkel also draws attention to the value of the study of the hemolytic properties of streptococci in prognosis and in determining the indications for treatment. He reports in detail a case of diphtheritic endometritis with parametritis in a patient delivered spontaneously, the infection originating in pyelonephritis or in pus from an abscess in the right breast.

In a second case, that had no internal examination, the original focus of infection was found in chronic suppuration in the left middle ear.

In a third case, streptococcus infection of the tonsil was present with metastatic abscesses in other portions of the body.

Hemorrhagic Sepsis. Sachs¹ reports the case of a robust woman, aged twenty-five years, admitted in the pregnant condition, with multiple subcutaneous hemorrhage. On vaginal examination, a fetus of two or three months was found in the vagina. The patient had had previously three normal pregnancies and labors, without nausea and vomiting.

The history stated that the patient had been in good health. She worked in a paper factory and had fallen in a faint condition from her machine. She was able to go home alone, and remained for some time without attention in her lodging. She had severe vomiting and pain in the back. The occurrence of hemorrhage led to her being brought to the hospital. The uterus was emptied of its contents, the placenta seemed absolutely normal, and secretions from the uterus showed the presence of bacteria of the non-virulent sort. The patient however, was in a desperate condition, with a scarcely perceptible pulse. She was practically comatose, with very slight elevation of temperature. The skin was dry, and minute hemorrhages beneath the skin were present in various portions of the body. The patient was well nourished, with a good muscular system, and the glands of the neck only were involved. There was hemorrhage in the retina and conjunctiva of the left eye. The respiration was rapid, the heart and lungs normal, the abdomen soft; the liver could not be palpated, but readily percussed.

There seemed to be a pathological condition in the throat, but it could not be distinctly made out. The urine contained abundant albumin, with some blood, abundant casts, and bacteria. The blood showed 4000 leukocytes, 4,000,500 red cells, and an excess of hemoglobin.

By exclusion virulent septic infection was diagnosticated. Death speedily followed, and autopsy showed a non-septic uterus and colon bacilli present in the blood, with multiple hemorrhage in the various organs. There was meningitis present, with the formation of pus, and this pus contained the *Bacillus coli communis*. No source could be found for the meningitis, and the case was considered one of virulent sepsis from blood infection, with *Bacillus coli communis* and meningitis, whose exact source could not be recognized.

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1908, Band lxiii, Heft 1.

PYOPHYSOMETRA CAUSED BY THE BACILLUS COLI COMMUNIS. Whiteford¹ reports the case in a patient who, sixteen days after a spontaneous labor, had a chill and pain in the abdomen. The lochial discharge had ceased fourteen days previously. The temperature varied from 100° to 102°, the pulse from 100 to 120. The patient was very anemic. There was a central globular abdominal tumor approaching the umbilicus, slightly tender and very movable. Under anesthesia, the cervix was dilated and a pint of stinking pus and gas evacuated. The pus was dark brown in color, with an odor resembling that of *Bacillus coli communis* infection. The uterus was irrigated with salt solution.

Digital exploration revealed no projection upon its mucous surface. A three-quarter-inch rubber tube was sewed into the cervix, the inner end lying three inches from the external os. The uterus was irrigated with peroxide of hydrogen and salt solution every four hours. The discharge and odor rapidly diminished, the patient grew worse, with vomiting and rigors, there was intense hemolysis, and death occurred eight days after operation.

An autopsy could not be obtained, but a vaginal examination was made, and a sloughing fibroid enucleated from the posterior wall of the uterus. The uterus was flabby and was not contracted.

Examination of the pus showed the presence of the *Bacillus coli communis*, with some liquifying organisms. In cases where gas is found in the uterus, the *Bacillus aërogenes capsulatus* is usually found. In this case it was absent, and the gas was formed by the *Bacillus coli communis*. The fibroid, which was situated above the cervix, had prevented the discharge of the lochia and the normal contraction of the uterine muscle.

The Opsonic Index in Puerperal Infection. Heynemann and Barth² contribute a paper upon this subject, giving the results of their investigations in Veit's clinic at Halle.

Their cases included puerperal sepsis, endocarditis, parametritis, thrombophlebitis, abscess in Douglas' pouch, puerperal peritonitis, puerperal streptococcus infection, endometritis, non-puerperal peritonitis, and erysipelas.

They conclude that the opsonic index in the blood serum of puerperal women without fever does not bear the relation to hemolytic streptococci indicated by the average reported by Wright, namely, 0.8 to 1.2. If the range of the index is enlarged from 0.7 to 1.3, further variations are observed, which are apparently explained by profuse infection with streptococci. A normal streptococcus opsonic index in a puerperal woman, with fever, gives no reliable indications regarding the nature and virulence of the infection. Variations from the normal indicate

¹ Journal of Obstetrics and Gynecology of the British Empire, September, 1908.

² Zeitschrift f. Geburtshülfe und Gynäkologie, 1908, Band lxxiii, Heft 2.

infection, but not its degree or virulence. Repeated observations tend to increase the accuracy of the result, but do not exclude errors in diagnosis, while the method is but rarely available, because of the difficulty and tedious technique. So far as a positive diagnosis is concerned, the method is of limited value and only occasionally applicable.

In making the prognosis, the opsonic index has no particular value. In prolonged cases of local puerperal infection, such as parametritis, the opsonic index may be of service in indicating the necessity for operation. These same facts apply with even greater weight in cases of infection with staphylococcus.

Jewett¹ reported before the New York Obstetrical Society, 7 cases illustrating opsonin therapy in puerperal septicemia. In 2 cases bacterial vaccines were used, and in one of these 10 c.c. of antistreptococcic serum was also injected. Both patients recovered. A third case of pyemia was subjected to the vaccine treatment, which resulted fatally on the nineteenth day. In a fourth case there was general septic infection, with streptococcus in the blood, and three injections were given. The temperature fell after each injection, remaining practically normal after the third injection. The fifth case was one of septicemia, with pelvic exudate and violent delirium. There had been an attempt at abortion by intra-uterine interference. The delirium subsided after the first vaccine injection, the patient receiving three in all, and recovering. In the next case, no apparent improvement followed the injection. This patient had partial placenta prævia with profuse bleeding at the seventh month.

In the first two cases the bacterial emulsion was prepared from the patient's blood. In the third, a stock preparation of *Streptococcus albus* and *citreus* was used at the first injection, and a polyvalent vaccine, representing nine strains of streptococcus, at the second and third, after the latter organism had been obtained from the uterine secretion.

These cases indicated that the best results are obtained in local and mild infections.

The Treatment of Puerperal Infection by Abscess Fixation. Boissard² publishes the results of thirteen cases of puerperal infection in which an effort was made to limit the spread of infection by producing a localized and carefully circumscribed abscess. This was done by injecting a preparation of turpentine into the lateral and anterior surface of the trunk below the thoracic wall, and in some cases in the thoracic wall. The quantity varied from 3 to 5 c.c., and in one instance 20 c.c., through an error in giving an order, was injected. The results differed from those seen after the injection of serum or preparations of silver. There was no elevation of temperature, chill, or sudden agonizing pain. Distinct pain occurred, but not of an anginose character. This per-

¹ American Journal of Obstetrics, March, 1908.

² L'Obstétrique, October, 1908.

sisted for two or three days after the injection, and was readily controlled by chloral or opium. The skin at the point of injection became red and tender and apparently edematous. An abscess formed about the sixth day, although it was sometimes difficult to detect true fluctuation. The pus was not serous or creamy, but a dark fluid containing debris and bits of cellular tissue. The abscess was opened on the seventh or eighth day, when the fluid had a distinct odor of turpentine. The abscess cavity was cleansed by copious irrigation with boiled water or peroxide of hydrogen.

The cases were all severe; four of them died from the third to the sixth day after admission; the others were apparently benefited by the use of this method.

The Operative Treatment of Puerperal Fever. A paper by Macan¹ gives the results of his experience in the operative treatment of puerperal septic infection.

He discusses the question whether it is possible by early operation to prevent the outbreak of severe puerperal fever, or to weaken and cure bad cases of bacteremia or toxemia. To avoid breaking down the barriers of resistance, he believes that the natural protective covering of wounds should not be removed. Puerperal ulcers, even when covered by diphtheritic-looking membranes, should not be scraped or curetted. The interior of the infected uterus, after confinement at term, should not be curetted. After early abortion the cervix should be dilated and the uterine contents removed, if possible, by the finger. The danger of curetting increases with each month of pregnancy. After labor, with the use of rubber gloves, a decomposing placenta or other debris should be removed in the most gentle manner possible. The brushing out method, *écouvillonnage*, employed by the French, may be used.

Where collections of pus form, they should, if possible, be drained by incision. If peritonitis is present, the diagnosis must be made between general and local peritonitis. If the infection be general, operation is usually useless; while if it be local and the abscess can be drained without breaking down the tissue, the result is often successful. Interference should be practised on the second or third day to be effectual.

The indications for operation are the steady failure in the patient's strength, with rise of pulse, increase in pain and swelling in the abdomen, and vomiting. Where the intestinal wall is paralyzed, operation is rarely successful.

The advantages which may be gained from operation in puerperal peritonitis are the removal of exudates, lessening the number of microbes and other poisons, relief to the pressure on the heart and lungs, lessening the damage to the intestine, removing if possible the original focus of infection, and preventing by drainage the reaccumulation of fluid.

¹ Journal of Obstetrics and Gynecology of the British Empire, October, 1908.

Incision may be made in the median line on both sides parallel to Poupart's ligament, with counter openings in Douglas' cul-de-sac and in the lumbar region. The openings in Douglas' cul-de-sac should be transverse, and made first of all to drain off as much as possible of the exudation. One, too, may be placed in Douglas' pouch, and one in each lumbar region. The openings above should be connected with the lower openings by tubes.

A modified Porro operation will often be valuable in removing the focus of infection.

Paralyzed intestines may be treated by puncture or incision, leaving small drains in each opening, or bringing the intestine out through the abdominal wound and surrounding it with gauze. Three openings may be made—one near the cecum, one near the duodenum, and one about half-way between these points; 50 c.c. of a 2 per cent. solution of collargol may be introduced into the peritoneal cavity.

In some cases the uterus is first thoroughly washed out and packed with 10 per cent. iodoform gauze. Douglas' pouch is then opened, the fluid allowed to escape, adhesions broken up by the finger, and the cavity packed with 5 per cent. iodoform gauze, brought everywhere in contact with the pelvic peritoneum. The urine should be tested every three hours for iodine, and salt solution given freely to prevent iodine poisoning. The uterine packing should be removed in three days, and the pelvic packing in a week. The results of this procedure have been good.

In severe cases operation may be done under scopolamine-morphine anesthesia.

Sixty per cent. of suitable cases have recovered after operations for pelvic and abdominal infection. In puerperal cases the difficulty lies in isolating the uterus, and thus cutting off the centre of infection. The results are good in gonorrheal cases and also in those of long standing. The removal of freshly suppurating tubes and ovaries is more dangerous during the puerperal period. They should if possible, be left for six to twelve months, and then removed after the bacteria have died. Such collections of pus may be opened and drained usually through Douglas' cul-de-sac. The removal of the uterus through the vagina will not give good results immediately after labor. Suppurating ovarian cysts should be removed.

Where the pelvic veins have become thrombosed, their removal by ligature is often successful in comparatively chronic cases. The great difficulty lies in choosing the time for operation and in excluding the presence of localized abscess. A thrombosed internal iliac vein can usually be felt through the vagina or rectum, and under favorable circumstances the thrombosed ovarian vein may also be palpated. Thrombosed veins in the broad ligament give to the examining finger the sensation produced by earth-worms.

If it is proposed to remove the inflamed veins or thrombi, the incision should be inguinolateral. If the vessels are only to be tied, the abdomen should be opened in the usual manner. Edema of the pelvic organs often follows such ligation.

The mortality of puerperal pyemia is so great that the operation should be attempted in all reasonably favorable cases.

The results following removal of the uterus in cases of bacteremia have not been encouraging. It is thought to increase the mortality instead of diminishing it, and is usually followed by general peritonitis. Porro's operation with thorough cauterization of the stump is the safest form of hysterectomy in these cases.

Collargol in Puerperal Infection. Bonnaire and Jennin¹ report their results obtained by the injection of collargol in puerperal sepsis. This substance may be prepared chemically or by the use of electricity. In the latter event the product is termed electrargol. This substance may be introduced into the body by the digestive tract by rectal or cutaneous injection through the mucous or serous membranes, by subcutaneous injection, or intravenous or intramuscular injection. Solutions may be made of 5 decigrams of collargol, 5 decigrams of egg albumin, and 50 grams of distilled water. One centigram of collargol and 10 centigrams of milk sugar may be given in the pill form. By rectal injection a solution of 1 to 100 has been employed. In ointments, 15 grams of collargol, 10 of white wax, and 90 of benzoinated lard may be employed. Vaseline and lanoline may also be used.

The results were sufficiently good to justify the experiment. Where local treatment by injections, curretting, digital exploration, cauterization, and écouvillonnage have failed to stop the progress of infection collargol may be employed. The most efficient method consists in intravenous injection, 10 to 15 c.c., in a 1 to 100 solution. This substance acts rapidly, but it is usually necessary to give two, three, or four injections, at twenty-four-hour intervals, to secure the best results. Clinically speaking, the injections may be repeated if the patient grows worse. In the interval between the intravenous injections collargol may be given by intramuscular injection, once or twice daily.

Adrenalin in the Treatment of Puerperal Infection. Langemeister² does not believe that collargol gives satisfactory results in the treatment of puerperal infection. Nuclein he believes to be equally valueless. He has obtained better results with the use of adrenalin, 10 drops of 1 to 1000 with 1000 parts of salt solution. He does not believe that this method can protect animals from infection or cause them to recover, as a specific might do. He does, however, think that adrenalin exercises a favorable influence in the process of recovery. Where freshly prepared antistreptococcic serum can be obtained it may be used, and where a

¹ L'Obstétrique, April, 1908.

² Monatsschrift f. Geburtshülfe und Gynäkologie, 1909, Band xxix, Heft 2.

freshly and properly prepared normal serum is available, it may be injected intravenously, with good results.

Puerperal Salpingitis. Friedman¹ has seen 21 cases of puerperal salpingitis. There are two forms—gonorrheal and those caused by other infection. In those usually styled septic, the streptococcus, staphylococcus, colon bacillus, and other organisms, bring about the condition. It is difficult clinically to separate the two forms. The disease usually declares itself in the third to the fifth day. The temperature rises, without chill, to 102° to 103°. In favorable cases the pulse is not greatly altered. The patient complains of pelvic pain on the affected side. There is tenderness on deep pressure, but less than one would expect. Vaginal examination usually fails to reach the inflamed tube. Pus appears in the lochia within twenty-four hours.

There are three types of the disease: Where the tube is closed its peritoneal end would open into the uterus, the symptoms being slight, and drainage occurring through the uterus. When both ends of the tube are closed, the symptoms are severe, the lochia normal, and the tube may rupture into the peritoneal cavity. When the uterine end of the tube is closed and the peritoneal open, the lochia is normal but the temperature high, and peritonitis often develops.

In making a diagnosis, the previous history of salpingitis is suggestive. The symptoms usually appear within forty-eight hours after labor. When the right tube is affected it may be impossible to eliminate appendicitis.

The prognosis was good in all but two cases, resolution occurring without treatment. The puerperal convalescence was lengthened by several days.

Moderate doses of codeine, an ice-bag over the tender area, and saline catharsis are usually efficient.

If the patient is nursing her child, lactation is usually not interrupted.

THE NEWBORN.

Studies in the Blood and Urine of the Newborn Infant. Cathala and Daunay² in their investigations have found that in the blood of the umbilical cord at birth, the corpuscles are very fragile. The resisting power of the blood increases, but at the tenth day it is still less than that of the blood in the adult. In the newborn, granular masses of hematin are observed, which increase during the first day of life, and then progressively diminish. They are rarely seen after the eighth day. Nucleated red cells are present at birth and during the first two days polychromatophiles, anisocytosis, and rarely myelocytes. In newborn

¹ Surgery, Gynecology, and Obstetrics, October, 1908.

² L'Obstétrique, December, 1908.

infants the blood does not give the phenomenon of auto-agglutination. Autohemolysis is rarely observed. In some infants after birth the serum presents traces of hemoglobin. In healthy children, whether a mild icterus was present or absent, a leakage of blood serum was not observed. Among the blood pigments found at birth, bilirubin is usually present. Pigments are abundant until the third day. They diminish from the fifth and sixth days. The urine is usually free from bile pigment, except in very small quantities, from the second to the seventh day.

In infants that have had icterus more pigment is observed in the blood and urine than those without this symptom. The condition of the blood and urine in the newborn resembles that seen in adults suffering from hemolytic icterus. This suggests that even the slight icterus so commonly seen in the newborn is of hemolytic origin.

No cause was observed for the fragility of the blood cells at birth. This seems to be a vestige of the intra-uterine condition.

Icterus in the Newborn. Esch¹ reports the interesting case of an infant born at full term after spontaneous labor. The mother's puerperal period was without fever. On the fourth day the child became jaundiced, and on the fifth day was severely ill. The jaundice was intense over the entire body, and cyanosis was present. There was slight stiffness in the neck and back, and tonic convulsions in the extremities. When the child was held with the head downward, yellowish mucus exuded from the mouth and nose. The breathing was of the Cheyne-Stokes type. There were rales over the lungs, the heart action was weak, and the radial pulse could not be felt. The temperature in the rectum was 35° C. There came from the bowel a discharge of yellowish mucus mixed with blood. Death occurred shortly afterward.

This was the third child of the mother, and the other two had, during the first days of life, slight jaundice, from which the first recovered. The second died soon after birth.

The father of the patient had suffered from severe jaundice, and one of his sisters also. A sister of the patient had a severe attack of jaundice caused by gallstones.

At autopsy the tissues of the entire body were deeply bile-stained, the brain especially showing this phenomenon in a high degree.

On microscopic examination the ganglia of the central nervous system were bile-stained, some of the cells necrotic and shrivelled, with highly colored bodies near the ganglion cells. In the muscles of the skeleton extensive degeneration of tissue was found, and the liver showed the presence of pigment in a small quantity in the liver cells. In the intestine, the coloring matter of the bile was abundantly present in rhomboid plates and needles. Bilirubin crystals were found extensively throughout the entire central nervous system.

¹ Zentralblatt f. Gynäkologie, 1908, No. 30.

A similar case reported by Beneke is briefly quoted: Schmorl distinguishes two forms of icterus neonatorum. In the first, or usual form, the brain is more or less diffusely stained yellow. In the second form, a deposit of coloring matter is circumscribed, and is seen most plainly in the central ganglia and central axis of the nervous system.

The diagnosis may be made during life by the development of tonic convulsions, which point to an involvement of the motor ganglia.

The prognosis is absolutely hopeless, and treatment is without avail.

Sclerema Neonatorum. Esch¹ reports the case of a multipara in whom the fetus presented by the prolapse of the left leg. It was extracted with difficulty, as the mother's pelvis was contracted and the head of the child was large. The child weighed 4310 grams (8 lbs.), was pale blue in color, without muscular tone or respiration, and without reflex excitability. A large quantity of mucus was removed from the trachea by catheter, and the child was revived by artificial respiration.

The mother and father were healthy, and the mother's puerperal period was normal. On the day after labor, the child developed hardened areas on both ankles, extending over the back of the feet. The left leg was bluish, resembling marble in appearance, and the condition was thought at first to have resulted from birth pressure. The face ultimately became swollen, the child lost in weight, and became jaundiced. Its bowel movements were normal, and respiration was maintained by keeping the child in an incubator and by giving it stimulation freely. It gradually improved, and was taken from the incubator, when it lost in weight, but afterward gained. The child ultimately recovered sufficiently to leave the hospital with the mother. The case was undoubtedly one of sclerema, and is especially interesting because of the recovery of the patient.

Gangrene of the Extremities in the Newborn. Komak² reports the case of an infant whose mother, a young primipara, had a normal pregnancy. Labor was complicated by a rigid cervix, and the child was delivered by the Tarnier forceps. The child was a male, weighing 4000 grams, (8 lbs.) and apparently normal.

The mother's lochia was foul for several days, and on the tenth day she had an urticarial rash, which speedily disappeared. The child had a slight secretion in the eyes, but did fairly well for several days, when it lost weight and nursed poorly. On the fifth day the stools became green. The cord was moist, but did not separate until the seventh day, a slightly secreting stump remaining. The temperature remained between 99° and 100°. On the tenth day a brownish discoloration was observed extending over both feet and ankles to the malleoli. This portion of the leg had subnormal temperature. Both hands became similarly affected, turning to deep purple, with slight pitting on pressure.

¹ Zentralblatt f. Gynäkologie, 1908, No. 31.

² Bulletin of the Lying-in Hospital of New York, March, 1908.

Gangrene of both lower extremities developed, and on the evening of the second day after the appearance of the lochial lesion the child died.

A culture taken from the uterus was negative. The mother was discharged on the eighteenth day in fairly good condition.

Autopsy showed congestion of the scalp tissues, with small hemorrhages over the occipital bones. The dura mater was congested, and there was complete thrombosis of one of the large veins extending in a vertical direction over the central part of the dura on the right side. The pia was edematous, and there was marked edema about the base of the skull. The fluid in the ventricles was excessive, and the brain substance normal.

Excepting a slight enlargement in the mesenteric glands, nothing else abnormal was found. No direct cause for the gangrene could be detected.

Four cases were collected from the literature. In one of them streptococcus infection was present, the child dying. The second case was treated by incision, the gangrene was arrested, and the child recovered. In the third case general septic infection was present, and in the fourth the staphylococcus pyogenes aureus was found in the multiple abscesses which formed.

The Surgical Treatment of Anorectal Imperforation in the Newborn. Martin¹ reports the case of a white male infant, sixty-one hours old, who had had no discharge from the bowels. The rectum was imperforate. The little finger was readily admitted to the anus, but found a blind, narrow, cone-shaped sac about an inch above the orifice. Left inguinal colostomy was done and a large quantity of meconium evacuated. The child reacted quickly and the wound healed promptly, the child making a good recovery.

Seven years and nine months later the child was seen in good condition. The growing anus admitted the first joint of the index finger. The surrounding skin was healthy and there was controlled bowel movement. A sound introduced through the inguinal opening passed upward and across into a large pouch—probably the dilated sigmoid. A wide interval existed between the finger in the rectum and the sound in the colon.

The parents of the patient positively declined further operation.

The good result in these cases was due in no small measure to the fact that the opening in the bowel was fortunately at the bottom or terminus of the colonic pouch.

Martin also reports three other cases, in two of which the bowel was opened through the anus successfully. The third child could not be operated upon, because the parents declined. It lived but a short time after birth.

¹ Surgery, Gynecology, and Obstetrics, September, 1908.

In examining the literature on the subject, the best results are obtained by perineal operation in preference to abdominal or transperitoneal procedures. Where, however, the child is in a desperate condition colotomy may be performed to afford temporary relief, and a perineal operation may, if desired, be done later.

The Treatment of Fracture of the Femur in the Newborn. Jones,¹ in 26 cases of fracture of the thigh occurring during delivery, found 8 in the upper third of the femur, 8 at the junction of the middle third, 7 in the middle third, and 3 in the lower third. Six of these cases were some weeks old, and the deformity was rectified by manual osteoclasis.

The treatment consisted in applying a Thomas knee-splint with extension. Extension poles were applied to the leg below the fracture, and the limb passed through the ring which encircles the thigh at the groin and which is padded with felt, leather, and impervious oil skin. The thigh is pulled and the extension maintained by the poles affixed to the lower end of the splint. The bandage is placed around the limb, and no further treatment is needed except to extend the limb by pulling upon the pole.

The child can be cared for as usual and no displacement of fragments can occur. The dressing is usually applied in five minutes, and an anesthetic is not necessary.

¹ British Medical Journal, June 6, 1908.

DISEASES OF THE NERVOUS SYSTEM.

By WILLIAM G. SPILLER, M.D.

DISEASES OF THE BRAIN.

Brain Tumor. TUMOR OF THE PITUITARY GLAND. Tumors of the pituitary body are assuming a much greater importance now than formerly, because of the attempts at surgical intervention. Purves Stewart¹ reports four cases of tumor in this region. He mentions that usually the general signs of intracranial pressure are relatively slight. Headache is often absent, vomiting is rare, and optic neuritis is generally absent, the tendency being to primary optic atrophy. In none of his cases was there any sign of acromegaly, even though the symptoms of tumor had been present many years. The tumors attained a remarkably large size, infiltrating some structures and distorting others without giving clinical evidences of local pressure. The crura cerebri may be flattened without producing diplegia or hemiplegia. The cavernous sinus may be infiltrated by tumor tissue without causing symptoms. The optic chiasm may give no indication of implication until late in the disease. Intense drowsiness was present in three out of Stewart's four cases. In female patients amenorrhea is frequent, in male patients loss of genital function may occur, and these signs may be associated with excessive adiposity.

All these statements of Stewart doubtless will be confirmed by those who have observed tumors of the pituitary body. I have seen a woman of middle age with a tumor of this region who had not menstruated since early womanhood. Unfortunately, Stewart's cases add little to the surgery of the pituitary body. Three cases in which operation was attempted terminated fatally, one five hours after operation, one two days after, and in the third, life seems to have been prolonged for months.

In my digest of last year I referred to a case reported by v. Eiselsberg and v. Frankl-Hochwart² of tumor of the hypophysis removed by an operation, in which the nose was laid to one side and the tumor was attacked at the base through the nasal passage. Another successful case is reported by the same authors. In both of these there were general adiposity and absence of the evidences of puberty. The operation has been performed in cases of acromegaly.

¹ Review of Neurology and Psychiatry, April, 1909, p. 225.

² Wiener klinische Wochenschrift, July 30, 1908, p. 1115.

In a very interesting paper, Otto Marburg¹ demonstrates that the *pineal gland* may have important functions, and may produce three forms of disturbance: (1) Premature development of the genital organs or genital hypertrophy; (2) universal adiposity; (3) cachexia. When a dyspinealismus is recognized the genital hypertrophy may be regarded as a hypopinealismus, the adiposity as hyperpinealismus, and the cachexia as apinealismus. The changes differ from those caused by disease of the pituitary gland, inasmuch as hyperpituitarismus causes genital hypertrophy; the hypopituitarismus, the adiposity; and the apituitarismus, the cachexia. The most common cause of these changes is tumor. The pineal gland is distinctly active functionally only in early childhood.

The functions of the pituitary body are only partially understood, and as operation on tumors of this structure are rapidly becoming fairly numerous it is important to know whether one may with safety remove the whole gland or must leave a portion of it. Reford and Cushing have carried out some experiments on animals. They conclude that the result of their observations sustain Paulesco's contention that a total hypophysectomy is incompatible with the continuance of life, although its average duration in their series of typical extirpations has been somewhat longer than that observed in his series of cases. It is a further contention of Paulesco's that the mere separation of the hypophyseal stalk from the infundibulum is equivalent to a total extirpation, and if this be the case it must be a further check upon the attempts at total extirpation, in man, particularly when conducted by the intracranial temporal route, when an accident of this kind is likely to occur.

Reford and Cushing,² therefore, infer from their experimental observations that the surgery of the hypophysis must be limited either to the removal of tumors which may implicate the pituitary gland, or, in case of hypertrophy, to a partial hypophysectomy.

TUMORS OF THE GASSERIAN GANGLION. Tumors arising in or near the Gasserian ganglion are not numerous, and few cases with necropsy are on record. I have recently reported two such cases.³ No case of operation with cure is to be found in the literature, but a result of this kind does not appear to be impossible. The diagnosis of the condition is usually easy, and tic douloureux may be excluded by nearly simultaneous commencement in all three branches, by involvement of the motor branch of the fifth nerve, and by impairment of the sensation of the face. Syphilitic meningitis may have to be considered. In some cases after operation pain has persisted. The evidence is increasing that pressure sensation may be conveyed by the seventh nerve.

¹ Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxvi, Nos. 1 and 2.

² Johns Hopkins Hospital Bulletin, April, 1909, p. 105.

³ American Journal of the Medical Sciences, November, 1908, p. 712.

Division of the sensory root of the fifth nerve is a justifiable operation when the pain is intense and the tumor cannot be removed.

Tumors of the Gasserian ganglion have also been the subject of a paper by Raffaello Giani.¹

TUMOR OF THE TEMPORAL LOBE. Schupfer has attempted to describe the symptom complex of tumor of the temporal lobe. The symptoms are: Partial paralysis of some of the branches of the oculomotor nerve, often slight and transitory, caused by pressure of the cerebral peduncle against the skull. Ptosis is more common, but other forms of oculomotor palsy may occur. Unilateral mydriasis with rigidity of the pupil may be the only form of this palsy. The disturbance is usually on the side of the tumor, but may be on the opposite side. Paresis of one side of the body may be on the side opposite to the oculomotor palsy, and usually is confined to the upper limb, or is more intense there; it may be associated with facial palsy. Occasionally the palsy of the limb is on the side of the tumor, and rarely Jacksonian attacks occur on the same side as the tumor.

The explanation is to be found in the pressure of the base of the skull against one or the other cerebral peduncle. The gait may be slightly cerebellar in type, with a tendency to fall backward or to one or the other side, probably from distance pressure on the corpora quadrigemina. Pain and stiffness in the neck may be felt. Disturbance of smell may be on the side of the tumor, or bilateral, with preponderance on the side of the tumor or on the opposite side. Vasomotor disturbances (cyanosis, edema, perspiration, coldness) may be on the paretic side. The patellar reflex may be diminished or lost on both sides. Alternating hemiplegia (abducent or facial palsy on one side, palsy of the limbs on the other) may occur. Hemianesthesia is rare and is caused by compression of the posterior limb of the internal capsule, or there may be the sensory symptoms of involvement of the parietal lobe. Paresthesia is frequent and is attributed by Schupfer to degeneration of the posterior roots. Athetosis, tremor on the paretic side, disturbances of hearing, taste, and smell, neuralgia of the fifth nerve, and disturbances of vision are other symptoms.

Unquestionably some of these symptoms occur from tumors in other parts of the brain, but the association of them is suggestive of tumor of one of the most "silent" regions of the brain, the temporal lobe, especially the right. Special disturbances are added if the lesion be left-sided.

A tumor originating in the cerebral peduncle is distinguished by early progressive and persistent palsy of the oculomotor nerve, by involvement of the lower as well as of the upper limb, by absence of ataxia with presence of distinct tremor.

¹ Mittheilungen a. d. Grenzgebiete d. Medicin u. Chirurgie, 1908.

Schupfer¹ discusses briefly also some of the symptoms of diffuse gliosarcoma of the spinal pia.

CYST OF THE OCCIPITAL BONE. A peculiar cyst of the occipital bone has been observed by Borchardt.² The patient was a man, aged twenty years. The symptoms began nearly two years ago with migraine-like attacks. He became stuporous and died. The thinning of the outer portion of the occipital bone was recognized during life, as the bone could be compressed with the finger. Reddish fluid was obtained by puncture, and was regarded as cerebrospinal fluid tinged with blood. The two tables of the occipital bones were widely separated, and the bony cyst contained not less than 500 c.c. of fluid. The cyst communicated with the enlarged left lateral ventricle. It seemed probable that the occipital cyst developed in the second year of life after a fall upon the occiput.

TUMOR OF THE PARIETAL LOBE. In the case of a tumor studied by Mills and Frazier³ the symptoms were left lateral homonymous hemianopsia, moderate hypesthesia of the left extremities, hypostereognosis, some ataxia with atactic tremor of the left upper limb, impairment by incoördination in the movements of the left limbs, and papillo-edema. A cyst measuring eight centimeters in length and four in diameter was removed by operation from the right parietooccipital region.

TUMOR OF THE UNCINATE GYRUS. A case reported by C. K. Mills⁴ is an interesting contribution to localization of the functions of taste and smell in the hippocampal and uncinat gyri. The patient had attacks in which she had sensations of taste and smell, recurring in the same way. She could not tell what the taste or smell was, although she sometimes thought that she was just about to be able to do this. The smell was somewhat like that of a flower, but she could not name the flower. These sensations were at times accompanied by smacking of the lips and chewing movements. Immediately after the gustatory and olfactory aura she became more or less dazed. Examination showed marked impairment of taste in the anterior two-thirds of the tongue, but smell was retained. A large glioma was found in the lower part of the left cerebral hemisphere, involving the uncinat, hippocampal, and fourth temporal convolutions. The attacks were of the character described by J. Hughlings Jackson as the uncinat group of fits. Mills gives an excellent resume of the literature on this subject.

TUMOR OF THE FOURTH VENTRICLE. Glioma growing from the endyma of the ventricles is a rare tumor, but when it occurs is likely to be in the fourth ventricle. In some instances these tumors have been found in all parts of the ventricular cavities. In a case reported

¹ *Monatsschrift f. Psychiatrie und Neurologie*, July, 1908, p. 63.

² *Berliner klinische Wochenschrift*, March 8, 1909, p. 464.

³ *Journal of Nervous and Mental Disease*, 1908, p. 481.

⁴ *Journal of the American Medical Association*, September 12, 1908, p. 879.

by me a tumor of this character gave numerous metastasis to the spinal pia. One of the most recent cases of multiple ependymal glioma is reported by Martens and Seiffer.¹ The diagnosis cannot be made with certainty, for a tumor of the fourth ventricle gives the symptoms of a cerebellar growth.

CEREBELLAR SPEECH. Bonhoeffer² has observed disturbance of speech occurring from a lesion of each lateral lobe of the cerebellum from operation on cerebellar tumor. The speech defect was not noticed until about a quarter of a year after the operation, and this delay may have been because in the improvement of other symptoms it was passed over, or because the later-forming scar tissue was the chief cause. The disturbance was a slowness in the speech. This Bonhoeffer compares with the incoördination or slowness of movement in the limbs following a cerebellar lesion, and called by Babinski *adiadokokinesis*.

Nystagmus is a common sign of tumor of the cerebellum, but there is a form of *hereditary nystagmus* that must be recognized. Nystagmus occurring in members of the same family is, according to E. Müller,³ uncommon, and he reports a family in which ten cases of hereditary nystagmus occurred in four generations, and was the only inherited defect. Only male members were affected, and yet the inheritance was only through the females, and these were healthy. In some families in which hereditary nystagmus occurs only the males are affected in one generation, and only the females in another.

FRONTAL TUMOR RESEMBLING PARESIS. The diagnosis between paretic dementia and tumor is not often a difficult one, but occasionally may be. Thus, Dercum⁴ reports a case of tumor of the frontal lobe which caused symptoms resembling those of paresis. The patient, a clergyman, had become easily pleased and indifferent to his duties, although at one time he had been exceedingly active. He ceased to worry about anything, was never serious, was careless in keeping his appointments, and indifferent as to beginning his services at the proper time. He had done various erratic things, such as visiting his friends and forgetting altogether the proprieties as regards the length of his stay. Instead of making a short call, as was his former custom, he would remain seated an entire evening until far into the night. At another time he visited some friends and instead of remaining for a day or two, remained, to their surprise, for a number of weeks. He appeared to be dizzy at times, and became somnolent.

Physical examination revealed a tremor of the tongue and some tremor of the lips. The patellar reflexes were possibly a little exaggerated. When asked to remove his clothing, he was found not to have a single

¹ Berliner klinische Wochenschrift, August 10, 1908, p. 1477.

² Monatsschrift f. Psychiatrie und Neurologie, November, 1908, vol. xxiv, p. 379.

³ Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxv, Nos. 5 and 6, p. 467.

⁴ Journal of Nervous and Mental Disease, 1908, p. 438.

undergarment upon his person, and he did not realize that this mode of dressing was peculiar. He had optic atrophy, secondary to neuritis.

At the necropsy an enormous tumor involving both frontal lobes, to an equal extent, was found. It measured anteroposteriorly two and three-quarters inches, transversely two and three-eighths inches, and in thickness, one and three-quarters inches. The frontal lobes were most affected in the orbital portions. The tumor was a sarcoma.

TUMOR OF THE CORPUS CALLOSUM. *Apraxia*, as manifested in the inability to use objects correctly, promises to be of some localizing value. Forster¹ reports a case with the symptoms of brain tumor and bilateral apraxia, greater on the left side. The diagnosis of tumor of the corpus callosum was made, and at the necropsy a glioma was found in the anterior part of this structure, but extending backward to the region of the central gyri.

Oppenheim, in the discussion of this case, remarked that he had diagnosed a tumor of the right side of the corpus callosum because of left-sided apraxia; the tumor was found in the right parietal lobe and implicated the corpus callosum. Rothmann mentioned that he had observed apraxia as a sign of hysteria. Liepmann stated that now four cases were recorded in which tumor of the corpus callosum had caused dyspraxia of the left hand, but Forster's was the first in which the diagnosis was made during life. Apraxia, in Liepmann's opinion, like aphasia, may be caused by hydrocephalus or other form of pressure.

ASYMBOLIA IN TUMOR OF THE MOTOR AREA. An interesting case is studied by E. Poggio.² His patient, after the removal of two cysticerci from the cortical motor region, was able to recognize the form of objects (stereognosis), but could not recognize and name objects in the left hand, although he could recognize those put in the right hand (asymbolia). The important features of this case are the asymbolia with preservation of stereognosis, and the location of the lesion in the motor area.

BRAIN PUNCTURE. Oppenheim has written an open letter to Fedor Krause, in which he discussed the importance of brain puncture as a valuable diagnostic method. Krause replies, and emphasizes the danger of hemorrhage. The course of the larger vessels is well known, but the pia veins are not always situated in the same positions, vary greatly in size, and have thin walls. The vessels may be displaced by a tumor. The danger of hemorrhage is not imaginary; it is especially great if angioma be present. If the puncture be made into an abscess there is danger of spreading the infection. Krause³ does not dispute that brain puncture may be of service, but it should be employed only when all

¹ Berliner klinische Wochenschrift, August 10, 1908, p. 1509.

² Neurologisches Centralblatt, September 1, 1908, p. 817.

³ Berliner klinische Wochenschrift, July 20, 1908, p. 1351.

other means have been exhausted, and when preparations for rapid trephining have been made in case it should be necessary.

LUMBAR PUNCTURE IN THE DIAGNOSIS OF BRAIN TUMOR. What appears to be a distinct advance in diagnosis is the finding of tumor cells in the cerebrospinal fluid, as shown by the report of a case by Sicard and Gy,¹ in which sarcomatous meningitis yielded sarcoma cells by lumbar puncture. A necropsy was obtained later. It would seem as though one had in lumbar puncture a valuable aid in the diagnosis of diffuse tumor formation in the central nervous system, but it is doubtful whether a solitary tumor would yield tumor cells in the cerebrospinal fluid.

HEADACHE. One of the most common signs of brain tumor is headache, but it is also a sign of many other conditions.

By indurative headache Yawger² refers to a condition much better known in foreign countries than at home, and yet one that seems to be common. Thickenings, at first of short duration but later persistent, appear at the insertions or within the muscles of the head and neck, and cause irritation of the sensory nerves and thereby pain. A paroxysm of pain may be occasioned by emotional disturbance, physical or mental fatigue, sudden exposure to cold, insufficient drying after washing the hair, etc. The swelling is at first soft and yielding, but later becomes an induration and has the consistency of cartilage.

The indurations are not confined to the head and neck, and may be found at the insertions of other muscles, and may cause the symptoms of sciatica. Gastro-intestinal disturbance, depression of spirits, pyorrhea alveolaris, etc., may be associated with these muscular pains. All cases of headache should be examined by forcible flexion and twisting of the neck, as these movements may cause intense pain at the insertions or within the substance of the neck muscles, especially during a paroxysm.

The treatment should be exercise, the drinking of water freely between meals, avoidance of overfatigue, proper diet, etc., and especially massage, vibration, and galvanism. Massage is the most effectual means of removing the enlargements. It is at first painful, but after a few treatments the hypersensitiveness disappears. Local application of methyl salicylate and capsicum in the intervals of the attacks may be useful. The bowels should be moved freely, and mineral waters especially are advised. Yawger reports three cases of indurative headache.

Ophthalmoplegic Migraine. As Bornstein³ mentions, the paralysis occurring with migraine has not always been confined to the oculomotor nerve; there have been observed hyperesthesia of the trigeminus, deafness, paralysis of the facial, difficulty in speaking, weakness of a limb, impairment of vision, and paralysis of the abducent and trochlear nerves.

¹ Revue Neurologique, December 15, 1908, p. 1245.

² Journal of the American Medical Association, April 24, 1909, p. 1316.

³ Monatschrift f. Psychiatrie und Neurologie, March, 1900, p. 255.

Bornstein accepts Charcot's dictum that this symptom complex is to be regarded as ophthalmoplegic migraine, and not as recurring oculomotor palsy, *i. e.*, the attack of migraine is primary and the paralysis is secondary. He favors the view that the cause may be swelling of the hypophysis; and reports three clinical cases of ophthalmoplegic migraine.

Aphasia. The case of aphasia reported by Ladame and v. Monakow¹ is remarkable in that complete motor aphasia without agraphia, and without paralysis of the limbs, existed about twelve years. The lesion destroyed Broca's area and the lower part of the ascending frontal convolution, and undermined the middle third of the ascending parietal convolution and the supramarginal gyrus. It might be argued from this case that destruction of Broca's region produces persistent motor aphasia, as the lenticular nucleus was not involved, but the authors acknowledge that in other cases on record, in which this zone was destroyed, the motor aphasia was not persistent, and they argue that on account of some individual peculiarity, of which they are ignorant, their patient was unable to overcome the cerebrolbulbar disturbance caused by lesion of association and other tracts.

Although the upper limb centre was destroyed, the upper limb was not parietic, and on this account the argument is advanced that the cortical centres probably cover larger areas than those assigned to them.

The views of Marie² regarding aphasia have aroused so much interest that the Neurological Society of Paris has held a special meeting to discuss them. Dejerine holds that word deafness does not exist in the aphasia of Broca, whereas Marie holds that the aphasic disturbances of comprehension, except in intensity, are the same in the aphasia of Broca and the aphasia of Wernicke (motor and sensory aphasia). Dejerine has taught that in motor aphasia printing is copied in script, whereas in sensory aphasia the copying is done according to the original, printing in printing, script in script.

Souques disputes the correctness of this statement, and reports that in three of his cases the lesion destroyed the zone of Wernicke and did not involve that of Broca, and yet printing was copied in script. There is, according to his view, no essential difference between the aphasia of Broca and that of Wernicke, and he accepts Marie's teaching that Broca's aphasia is merely sensory aphasia with the addition of anarthria. What Dejerine calls total aphasia, Marie regards as Broca's aphasia, but the distinction, as Marie points out, is one of intensity, not of quality.

Marie believes that the disturbance of speech in motor aphasia is a disturbance of articulation; in this he was not upheld by the majority of those who took part in the discussion. Marie, however, admits that the internal language is affected in Broca's aphasia. Pure motor aphasia in his opinion is nothing more than anarthria, which he is willing

¹ L'Encéphale, March, 1908, No. 3.

² Revue Neurologique, June 30, 1908.

to call aphemia. This view also was disputed, some holding that in pure motor aphasia, as well as in the aphasia of Broca, the internal language is affected.

The arguments brought against Marie's lenticular zone by Dejerine and Madame Dejerine¹ in this discussion are: That the zone has no well-defined limits above or below; that it includes a part, if not all, of the cortical motor area; that the foot and cap of the third frontal convolution, the essential part of Broca's area, form a part of the zone; that in some of the cases retrograde degeneration has been traced from the lesion into the third frontal convolution; that the aphasia is a result of the lesion of fibers from the frontal lobe; that the aphasia produced by a lesion of the lenticular zone is not Broca's aphasia, but total aphasia, as it is associated with sensory aphasia; and that the aphasia of Broca is not an association of motor and sensory aphasia. After this long discussion the two men who were the leaders in the argument ended where they had begun. Marie was unconvinced and Dejerine in no way altered his position.

Apraxia. J. H. W. Rhein's² case of apraxia with necropsy is as follows: A man, aged fifty-five years, at the time of his admission to a home for incurables was blind, was totally unable to designate the position of the limbs, could not locate touch anywhere, could not recognize objects by the sense of touch, and his touch and temperature senses were imperfect in the left hand. The left hand, although capable of some reflex acts, could not be moved voluntarily. The right hand was apraxic, and apraxic phenomena were present in chewing and walking. The necropsy revealed the presence of degeneration of the white matter of the right occipital and parietal regions on the convexity and the posterior portion of the temporal lobe, the calcarine region remaining intact. The inferior longitudinal fasciculus and the optic radiations were degenerated on the right side, and probably also on the left side, although less markedly. On the left side there was degeneration in the occipital and temporal regions to a much less degree, leaving the median surface intact. The corpus callosum in its posterior portion was degenerated. Elsewhere the brain was apparently normal.

Hemiplegia. Muratow³ accepts the view that choreic or athetoid movements depend on a lesion of the anterior cerebellar peduncle, and does not believe that they are caused by a cortical lesion. He denies that a distinct bundle of sensory fibers exists in the internal capsule, as Charcot taught (*carrefour sensitif*).

CONVULSIONS IN HEMIPLEGIA. Occasionally convulsions occur with the onset of hemiplegia, and it has been concluded by certain authors that they indicate an escape of the blood into the lateral ven-

¹ *Revue Neurologique*, September 30, 1908.

² *Journal of Nervous and Mental Disease*, 1908, p. 619.

³ *Monatsschrift f. Psychiatrie und Neurologie*, June, 1908, p. 510.

tricles. This view has always seemed to me questionable. A. R. Allen has studied ten cases, with necropsy, in an attempt to throw light on this subject. In four cases in which convulsions occurred the hemorrhage ruptured into the ventricles and the optic thalami were implicated. One patient had convulsions, no hemorrhagic rupture into the ventricles, but an involvement of the cortex and subcortical white matter of a sensory region. Three patients had no convulsions and no optic thalamus involvement. Two of these had ventricular inundation; one of them had not. One patient had no convulsions and had optic thalamus involvement, but the case was not sufficiently under observation to permit positive statements.

Allen's¹ conclusions are that ventricular inundation in cerebral hemorrhage has no etiological bearing on the convulsions or rigidity. Convulsions and rigidity in apoplectiform hemiplegia are probably frequently due to an involvement of the optic thalamus or the cortico-thalamic sensory fibers, with the necessary proviso that enough of the posterior limb of the internal capsule remain uninjured to convey the motor impulses. Convulsions and rigidity in apoplectiform hemiplegia may be caused by a sudden or rapid increase in intracranial pressure due to cerebral hemorrhage, even though the optic thalamus and the corticothalamic sensory fibers are uninvolved. There must, however, be a sufficient preservation of the motor part of the internal capsule for the transmission of impulses to the parts concerned. It is altogether unlikely that pressure or chemical change acting on the motor axons of the centrum or internal capsule, these axons having been severed from their perikaryons by the hemorrhagic process, could exert a stimulating action sufficient to cause convulsions or rigidity.

PLEURITIC HEMIPLEGIA. Very little is known concerning epileptiform convulsions and hemiplegia occurring in the course of *pleural effusions*, especially after such operations as thoracentesis, thoracotomy, and pleural lavage, and therefore it is worth while to devote a little space to the article of Lereboullet and Tournay,² appearing in the form of a note in the London *Lancet* and taken from a French journal. The pathology of these conditions is obscure. Hemiplegia may occur both in serous and purulent pleurisy. It usually occurs on the same side as the effusion after some surgical intervention. It may or may not be preceded by convulsions, and usually its evolution runs parallel to the pleurisy, rarely persisting after recovery from the latter. Different causes—embolism, "toxi-infection," reflex action, nervous inhibition, and hysteria—have been invoked to explain the hemiplegia.

In the case reported by the authors exploratory puncture and then thoracentesis were performed, as the state of the pulse caused syncope to

¹ Journal of the American Medical Association, July 18, 1908, p. 216.

² London *Lancet*, September 12, 1908, p. 827.

be feared. Twelve hundred cubic centimeters of a citrine-colored fluid were withdrawn. The operation was well borne. On the seventh day after the operation the patient suddenly became excited, attempted to speak, and stammered in a condition of anguish. He had great difficulty in articulation and stammered, but he perfectly comprehended what was said to him and what he wished to say. There was marked paresis of the right side of the face, the cheek was a little flaccid, and the mouth was slightly drawn to the left. He felt numbness in the entire right side of the body, and could scarcely move the lower limb on this side, and could not move the upper limb at all. The power of movement gradually returned after a few hours, but weakness seems to have persisted a few weeks. The hemiplegia was organic. The authors suggest that a small embolus may have been the cause, and may have originated in the left auricle from thrombosis produced by pressure of the effusion, or in the pulmonary veins.

TRANSITORY HEMIPLEGIA. An interesting contribution to the subject of temporary hemiplegia occurring in elderly persons is given by F. H. Edgeworth.¹ He concludes from a few clinical cases that temporary aphasia and right hemiplegia, or left hemiplegia, or vertigo, or mental confusion, may be associated with (1) no arteriosclerosis, no general hypertonus, no rise in blood pressure; or (2) arteriosclerosis but no general hypertonus or rise in blood pressure; or (3) arteriosclerosis, general hypertonus, and rise in blood pressure.

The theory of a localized hypertonus, an arterial spasm, in cerebral bloodvessels affords an adequate explanation of these various cerebral phenomena. It accounts for their often sudden appearance, and for their equally sudden and complete disappearance. Such arterial spasm may apparently be limited to one or more cerebral arteries, or may form a part of a more general vascular constriction. He supports this theory by the following arguments:

It is recognized that localized arterial spasm may occur in parts of the body other than the brain; for instance, in the extremities, in Raynaud's disease. In a few recorded cases of that disease, notably in two of Osler's, attacks coincided with the occurrence of various temporary cerebral phenomena, exactly similar to those described by Edgeworth.

In some cases the paralysis may be preceded by clonic spasm in the subsequently paralyzed limb, or the attack may consist of clonic spasm only. Such phenomena resemble the unilateral clonic spasms which can be produced by digital compression of one carotid artery, and the general convulsions which may occur in Stokes-Adams' disease, as the result of too long an intermission between the auricular and ventricular contractions.

¹ Practitioner, May, 1909, p. 613.

In some cases there may be a most striking parallelism between the state of the radial artery and the cerebral phenomena.

Recent experiments have shown that the cerebral arteries have a vasoconstrictor nerve supply.

In a first attack it may be difficult to exclude hemorrhage or thrombosis. Edgeworth believes that where the plantar reflex is extensor in a case of suddenly occurring hemiplegia, the cause is an organic one; if not extensor, the disease may be, though exceptionally, of organic origin, or it may be caused by vascular spasm.

I cannot accept this statement as furnishing a reliable means of diagnosing between organic and functional hemiplegia. Hemiplegia, due to vascular spasm, is in some, but not in all, cases attended by a rise of blood pressure. Thrombosis, Edgeworth states, is not so attended, cerebral hemorrhage, if at all large, is accompanied by a very great rise in blood pressure.

Recurring vascular spasm may end in permanent palsy resulting from cerebral softening. The treatment is easy where the diagnosis of vascular spasm is certain. Experience shows that the administration of vasodilators, in quantity sufficient to make the pulse soft, will rapidly remove the condition; probably it postpones the day of permanent paralysis. The treatment with vasomotor dilators is the worst possible for cases of thrombosis or hemorrhage.

Delayed Apoplexy. Under this designation is meant apoplexy occurring days, or even a week or more, after trauma of the head. Alfred Reginald Allen¹ reports a case of this character, and gives extensive references to the literature on the subject. The cases may be of medico-legal importance, but there may be great difficulty or impossibility in the attempt to establish a relationship between the apoplexy and the trauma. Allen's conclusions are that traumatic delayed apoplexy is in all probability an entity. It is not necessarily a condition in which hemorrhage takes place, but the stroke can have as its immediate etiological factor the occluding or thrombosis of one or more arteries. The cerebrospinal fluid does not play a necessary part in the production of delayed apoplexy, and injury to the region of the aqueduct and fourth ventricle is a collateral circumstance of no etiological moment. In cases of delayed apoplexy in which hemorrhage takes place, the hemorrhage is not necessarily preceded by a process of necrotic softening about the artery in question, this removing the outside support, but the artery itself is injured, and the secondary rise in arterial pressure or the normal pressure causes the hemorrhage. The trauma to the head causes a mechanical agitation to the brain substance, which falls with greatest severity on the arteries, small and large, they being filled with an incompressible fluid. At first there is probably a general vaso-

¹ Journal of Nervous and Mental Disease, 1908, p. 763.

motor constriction of the cerebral vessels, followed by paresis of the vessel walls. The vessels particularly injured undergo endothelial proliferation, and thrombosis occurs.

Diplegia. A symptom complex that seems worthy of consideration is one described by me as depending on a lesion of the uppermost portion of the anterior spinal and adjoining portion of the vertebral arteries. We should expect to find paralysis of all the limbs, trunk, and neck, whereas the reflexes necessary for life would be preserved. The face would not be affected. The tongue might escape, as the hypoglossal nerve has at least a portion of its origin above the anterior spinal arteries, but it might be involved by implication of the vertebrals. As the lemniscus probably conveys fibers of deep sensation, this form of sensation probably would be disturbed. Tactile sensation also might be affected. The condition of the tendon reflexes is uncertain. The vagus and glossopharyngeus should escape, at least in great part. Ataxia probably would not be observed because of the motor paralysis or the escape of important cerebellar fibers.

In the paper¹ in which this symptom complex is discussed, a clinical case is reported that probably belongs to this group.

Occlusion of the Posterior Inferior Cerebellar Artery. The symptom complex of occlusion of this artery, as I have been able to determine it from two cases of my own with necropsy and from cases in the literature, is usually sharply defined, although it may be difficult to exclude implication of the vertebral artery. The onset is usually sudden and without disturbance of consciousness. The limbs are not paralyzed, or at most are paretic on the side opposite the lesion, and the paresis is not persistent. Pain and temperature sensations are diminished or lost in the limbs of the side opposite the lesion, and in the whole or a part of the fifth nerve distribution on the side of the lesion, occasionally also in the face on the side opposite the lesion. Spontaneous pain or paresthesia may be felt in the area of disturbed objective sensation. Tactile sensation and sense of position are usually intact. Ataxia may be present in the limbs on the side of the lesion, with a tendency to fall toward the side of the lesion. Paralysis of the muscles of deglutition, of the soft palate and larynx, occurs on the side of the lesion, with smallness of pupil, retraction of eyeball, and narrowing of palpebral fissure (sympathetic paralysis) on the side of the lesion. Hiccoughing and vomiting may be obstinate, and the pulse may be rapid from paralysis of the vagus. The deep reflexes usually are diminished or lost, but may be exaggerated. Headache may be intense.

These are the principal symptoms, but there may be others, nystagmus, vertigo, disturbance of micturition, paresis of the tongue, of the seventh nerve distribution and external rectus, and impairment of taste on the side of the lesion, etc., depending on the extent of the thrombus.

¹ *Journal of Nervous and Mental Disease*, 1908, p. 775.

I found sixteen reported cases in which necropsy was obtained, and there are others purely clinical in the literature. The right posterior inferior cerebellar artery is sometimes absent, and the lesion is more commonly left-sided. The occlusion affects the lateral and posterior part of the medulla oblongata without extending to the periphery and without producing lesions of the cerebellum, as the anastomosis in the latter is usually sufficient to prevent softening. The symptoms are explicable by the anatomy of the part affected.¹

A case belonging to this group, with necropsy, has been reported by Français and Jacques.²

Family Infantile Cerebral Palsy. A remarkable occurrence of cerebral palsy in the same family is described by v. Malaisé.³ The parents were related. They had nine children; all were born at full term and without difficulty. Six of them became sick with fever in their third year of life, without unconsciousness or convulsions. Shortly afterward the gait became affected, although in one of the children the disturbance of gait disappeared. Four of the children became unable to walk and had contractures of the feet, and later rigidity and athetosis of the upper limbs. In one of them the disorder was confined to the lower limbs. Three had great disturbance of speech and intellect. No symptoms were found in three of the children or in the parents.

The fever may merely have hastened a congenital tendency to the disease, or may have been such a fever as is common in many children, especially those of delicate constitutions. The disorder was a family, but not a hereditary one, was progressive, and clearly cerebral. Disease of the thyroid gland was found in all the affected children except one. No necropsy was obtained.

Acquired Spasticity with Athetosis. Primary athetosis is rather rare. Lewandowsky distinguishes between simple acquired athetosis and similar forms developing after hemiplegia. The former is not a post-hemiplegic athetosis affecting both sides, or a result of infantile spastic diplegia, but is an independent peculiar disorder, whose pathology is not definitely known, and probably consists of bilateral cerebral lesions. Oppenheim also makes the distinction. Previous diplegic disturbances should be excluded if the term primary double idiopathic athetosis is employed. In a case reported by Haupt small cortical foci were found in the left parietal lobe.

I⁴ have had the opportunity of observing a case of acquired spasticity with athetosis during a period of about five years. The boy when first seen by me was seven years old. At that time he had begun to be lame in the left lower limb. He was unable to stand without bending the

¹ Journal of Nervous and Mental Disease, 1908, p. 365.

² Revue Neurologique, June 15, 1908, p. 521.

³ Neurologisches Centralblatt, November 1, 1908, p. 1018.

⁴ Journal of Nervous and Mental Disease, 1908, p. 453.

knee backward, and in walking the lower limbs seemed to be spastic. There was little weakness of the lower limbs at that time. The patellar reflexes were prompt. During the five years the boy was under observation the lower limbs gradually became very spastic, but the spasms partially relaxed at times. Some atrophy from disuse developed. When he was entirely at rest, involuntary jerking occurred occasionally, but any movement caused jerking resembling athetosis. The patellar tendon reflexes were exaggerated. The most reasonable explanation for this gradually developing spasticity and athetosis of the limbs is progressive degeneration of the pyramidal tracts.

Meningitis. Crowe¹ reports in detail the treatment of a case of meningitis by *urotropin*. A boy in whom a cerebrospinal fistula had occurred after a suboccipital operation for cerebellar tumor had a purulent discharge from this opening and a temperature between 100° and 103°. Ten grains of *urotropin* were given by mouth and a chemical test made a few hours later showed that the escaping cerebrospinal fluid contained the drug in considerable quantity. The dose was increased to thirty grains a day, diluted with a large amount of water. After a week the temperature slowly fell to normal, and the escaping fluid gradually lost its purulent character and became less in amount, so that three weeks after the administration of the first dose of *urotropin* the patient's temperature had reached normal and the fistula had entirely closed.

Further investigations regarding the effects of *urotropin* were made. In cases of chronic nephritis, brain tumor, or hydrocephalus, when lumbar puncture was to be performed, the patients were given a preliminary 10 or 15 grain dose of *urotropin*, and the cerebrospinal fluid after removal was tested by a modification of Hehner's test (the test is described by the author). In all the cases the chemical test was positive, showing that *urotropin*, after its administration by mouth, invariably appears in the cerebrospinal fluid. After a 15 grain dose, the maximum concentration seemed to be reached after a period of from thirty minutes to one hour.

Experiments showed that animals that have received several doses of *urotropin* before the cerebrospinal space was inoculated with pathogenic organisms will, even if recovery does not actually take place, survive longer than animals that have received the *urotropin* after the inoculation, and much longer than those to whom none of the drug has been administered.

During the past year it has become a routine measure in the Johns Hopkins Hospital to promptly administer *urotropin* to all persons with lesions that not infrequently are followed by infections of the meninges, and owing to the complete absence of such a complication in quite an extensive series of cases, the prophylactic importance of the drug seems

¹ Johns Hopkins Hospital Bulletin, April, 1909, p. 102.

fairly well demonstrated. It has been employed in compound fracture of the skull, gunshot wounds of the head, in patients with cerebrospinal fistula; it has been used as a preliminary to the performance of ventricular or lumbar puncture, etc.

TREATMENT BY FLEXNER'S SERUM. The conclusions to which L. W. Ladd¹ arrives after the employment of Flexner's serum treatment for epidemic cerebrospinal meningitis are: that he has no doubt as regards the wonderful efficacy of the serum, provided it be used on patients not moribund or on those in whom chronic hydrocephalus has not already developed. He believes that statistical reports excluding these cases will show that our percentage of recovery will contrast favorably with our previously high percentage of death.

Frank J. Sladen² thinks that all cases of meningitis in which meningococcus infection is suspected should undergo lumbar puncture and serum injection as early as possible. The serum does no harm in cases not of meningococcal type, and may do good. The course of the disease is changed by the serum. The long drawn-out chronic cases are not seen, and the terrible sequelæ are rare.

CIRCUMSCRIBED SEROUS SPINAL MENINGITIS. This condition has received so little attention that probably comparatively few were familiar with the literature on the subject, and it has seemed to me desirable to present what little is known in a brief paper. The condition is one of cyst of the pia arachnoid containing a clear colorless fluid, probably cerebrospinal fluid. Such a collection causes circumscribed compression, and the symptoms are those of spinal tumor. Operation may give complete recovery if performed sufficiently early, as the cyst, when evacuated, apparently does not reform. The case reported by Spiller,³ Musser, and Martin was the first with operation, and the patient is still well, six years after the operation.

When this case by Musser, Martin, and myself was published, in 1903, nothing like it could be found in literature, although a case had been reported by Schlesinger in which the lesion was found at necropsy. The excellent presentation of the subject by Kurt Mendel and Adler⁴ shows that the disorder may be more common than has been supposed. The symptoms in their case were spastic paralysis of the lower limbs with exaggerated reflexes, Babinski's reflex, and disturbances of objective sensation and of the bladder and bowels. The diagnosis was tumor of the spinal cord or vertebral caries. When a slit was made in the spinal dura, the arachnoid membrane presented in the opening as a cyst, and when this was punctured, fluid escaped under pressure. The improvement in the symptoms following this operation was very great.

¹ Journal of the American Medical Association, October 17, 1908, p. 1315.

² *Ibid.*, p. 1318.

³ American Journal of the Medical Sciences, January, 1909, p. 95.

⁴ *Derliner klinische Wochenschrift*, August 31, 1908, p. 1596.

Krause found spinal serous meningitis in 6 out of 22 cases in which he operated for spinal tumor, and since then Bruns has observed a case. The method of formation of these cysts of the pia arachnoid is unknown, but inflammation probably plays an important role. There is always danger that some other organic disease is associated, and search at the time of operation should be as thorough as circumstances permit.

In the case reported by L. Bruns¹ progressive improvement occurred after operation with discharge of the fluid, and recovery was almost complete after twenty months. Disease of the vertebræ or intramedullary spinal disease could be excluded, and the patient showed no evidence of tuberculosis. There seemed to be no process present that secondarily could cause the collection of fluid in the pia arachnoid, and therefore Bruns regards his case as an example of idiopathic circumscribed serous spinal meningitis, a condition that is regarded as questionable by some investigators.

An interesting and important contribution to this subject is made by Sir Victor Horsley.² He emphasizes that a means of distinguishing between this condition and spinal tumor is to be found in the diffuseness of the symptoms indicating the implication of many roots in chronic meningitis. He refers to several cases in his practice, but so far as I am able to judge he did not find in any a cyst of the pia; the condition was localized chronic meningitis. The treatment he advises is laminectomy, opening the dura and washing out the dural space with a mercurial lotion of 1 to 1000. He advises leaving the dura unsutured, but complete closure of the skin wound, as the fluid is thus allowed to escape into the tissues and is absorbed. Many cases of so-called acute myelitis are really meningeal in origin in his opinion, and laminectomy and free drainage of the subdural space might arrest the process and the subsequent fatal injury which the cord sustains in such conditions.

Bliss³ also discusses circumscribed serous spinal meningitis.

Cerebral Syphilis. Some important statements regarding syphilis of the nervous system were made by Nonne⁴ at the second meeting of the Association of German Neurologists. The *Spirocheta pallida* has not proved to be of value in clinical diagnosis; it has been found only a few times in the nervous system, and then only in the brain, and only once in the cerebrospinal fluid during life.

The beneficial effects of mercury are no proof of the syphilitic nature of the disease.

Unilateral internal ophthalmoplegia, as an only sign, has been regarded as indicative of syphilis. Nonne, however, has found that reflex rigidity

¹ Berliner klinische Wochenschrift, September 28, 1908, p. 1753.

² British Medical Journal, February 27, 1909, p. 513.

³ Interstate Medical Journal, May, 1909, p. 338, and Journal of the American Medical Association, March 13, 1909.

⁴ Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxvi, Nos. 1 and 2.

and total rigidity of the iris occur more frequently in uncomplicated chronic alcoholism than is generally known, but isolated organic anomalies of the pupil in association with aneurysm of the aorta he has seen only in syphilis, and he regards this combination of symptoms as indicative of syphilis.

The variation in the intensity and extent of the symptoms he believes is not so common in syphilis of the nervous system as the literature indicates, and it is seen in brain tumor and chronic uremia.

Nonne concludes, from the study of a very large number of cases in which lumbar puncture was done, that a very pronounced lymphocytosis (pleocytosis) is indicative of syphilis of the central nervous system, but he emphasizes that all clinical features must also be taken into consideration, as the cellular increase occurs also in multiple sclerosis, tumor of the brain, idiopathic hydrocephalus, and post-traumatic psychoses. Cytodiagnosis is of no value in distinguishing tabes or paresis from neurasthenia in a person who has had syphilis.

Nonne has found the Wassermann reaction of value, but he expresses himself guardedly, acknowledges the difficulties of the method, and remarks that the future must determine its practicability.

Mott¹ has had one case in which well-marked signs of meningitis occurred while the primary sore was yet unhealed. He refers to a case reported by Boidin and Weil, in which a young man had a hard chancre the middle of June, headache the middle of July, symptoms of meningitis and lymphocytosis of the cerebrospinal fluid August 5, and roseolar rash August 12. He was cured of the meningitis by inunction August 17. Only Hoffmann has succeeded in showing that the cerebrospinal fluid may be infective, for he has successfully inoculated a monkey with this fluid obtained blood free and taken with all precautions from a man suffering with a papular syphilide. Dohio and Tanaka are said to have found spirochetæ in the cerebrospinal fluid in the case of a patient with a papular eruption. Mott thinks it is possible that centrifuging a fluid of such low density would disintegrate these delicate organisms.

It is not infrequently impossible, except by culture or inoculation, to find tubercle bacilli in the cerebrospinal fluid of tuberculous meningitis. Until experimental investigations have been made with fluid obtained from early acute cases of syphilitic meningitis, Mott believes the absence of the organisms upon microscopic examination and failure of experimental inoculation are no valid argument against these organisms being the cause of the meningitis. Syphilitic meningitis may occur at any period after infection. Mott has described a case of congenital syphilis in which it developed at the age of sixteen years. He states it is generally admitted that the subjects of tabes and general paralysis are recruited

¹ British Medical Journal, February 20 and 27, 1909.

especially from those individuals who have had a mild attack and who very seldom show any signs or symptoms of tertiary gummatous skin, visceral or bone lesions. He has never seen a patient with general paralysis having a primary sore or a secondary rash, and this supports the opinion that general paralysis is a parasyphilitic disease. It is a question whether antisiphilitic treatment prevents the development of the parasyphilitic diseases of the nervous system. Mott says it is known that many people develop general paralysis or tabes dorsalis, even though they have been treated with mercury systematically from the primary infection. So much has this impressed some authorities that they have asserted that overmercurialization is the cause of the diseases in question. Mott brings evidence to show that congenital syphilis may be the cause of parietic dementia developing as late as middle life, and that distinct clinical signs of congenital syphilis in the body may be absent. Only 3 to 5 per cent. of the persons infected with syphilis develop parasyphilitic diseases, but also only 10 to 15 per cent. of those afflicted with diphtheria develop postdiphtheritic paralysis, and usually the local diphtheritic process is mild and often unnoticed.

DISEASES OF THE SPINAL CORD.

Tabes. BONE SENSATION. Egger¹ has held that the periosteum, capsules of the joints, and ligaments are endowed to an extraordinary degree with vibratory sensation, while the skin and muscles have very little of it. If a tuning fork in vibration be placed lightly upon the skin the vibrations will not be felt unless the surface of contact be increased by the interposition of a flat piece of wood or some similar substance, but they will be felt at once if the fork be placed in close contact with bone. When the bone perception of vibration is lost the cutaneous is also always lost, but the skin may be deprived of this sensation while it is still retained by the bone. When the vibratory sensation is lost, it is lost in all the tissues of the affected part; but when it is weakened, it disappears in the part where normally it is slight, viz., the skin. Tactile sensation must be preserved in order that localization of vibratory sensation may be possible.

In testing the bone sensation, the limb should be in extension and the vibrations should not be too strong. One bone may have vibratory sensation, while the adjoining bone may have lost it. The sense of vibration is very important in the human economy, and comes into play in every form of locomotion. The reflex produced by it maintains the muscular tonus by stimulation of the nerve cells. As in standing still this vibration is wanting, standing is more fatiguing than walking.

¹ *Revue Neurologique*, April 30, 1908, p. 345.

A tabetic patient has more difficulty in walking on soft ground than on a firm pavement, because the vibrations in the former method are less intense. Steherbak has produced spasticity and increased reflexes by strong vibrations, and has caused a return of tendon reflexes by this method after they had been lost. There seems to be in this a suggestion in the treatment of tabes, a disease in which diminished tonicity is so conspicuous.

TABES AND SYPHILIS. Brissaud and Bauer¹ have reported a case in which symptoms of chronic syphilitic meningomyelitis appeared thirty years after the primary infection. It seemed certain that the pains and vesical disturbances appeared at this late period, but the authors acknowledge that pupillary signs and leukocytosis of the cerebrospinal fluid may have been present earlier. The cytological examination of the cerebrospinal fluid revealed almost as many polynuclear cells as lymphocytes. This finding would seem to indicate a subacute process, and yet the development of the symptoms was distinctly chronic.

In the discussion following, Dejerine stated that he had observed the first symptoms of tabes appearing fifty years after the infection. Babinski mentioned a case in which the symptoms of tabes had been delayed forty years. Dufour believes that tabes is likely to be mild when it is delayed a long time after the infection, as this delay seems to indicate a certain immunity of the nervous system. The longest period intervening between the primary lesion and symptoms of implication of the nervous system observed by Raymond is fifty-two years.

The paper by Fritz Lesser² contains some important statements regarding syphilis. From investigations made at the Moabit Hospital, in Berlin, he demonstrated that in about half of those who had been infected with syphilis, syphilitic lesions in the inner organs occurred after ten to twenty years. These were in the liver, lungs, heart, testicles, etc., and had been overlooked in the clinical examinations.

In all the cases of gumma of the liver, thirty in number, a correct diagnosis had not been made during life, in twenty-two no symptoms had been present, and in the remaining eight the condition had been supposed to be cirrhosis of the liver. Investigations have shown that in about half of the late cases of syphilis without clinical signs of syphilis, the *Wassermann reaction* is positive. Lesser has demonstrated that the positive reaction may be changed to a negative reaction by anti-syphilitic treatment. In 27 out of 96 cases of tabes, he found positive syphilitic lesions at necropsy. He has shown also that a negative reaction of the blood serum is strongly contrary to a diagnosis of paresis, but he has obtained a positive reaction in only about half of his tabes cases, probably because tabes is a disease of long duration. Syphilitic

¹ Revue Neurologique, January 30, 1909, p. 94.

² Berliner klinische Wochenschrift, September 28, 1908, p. 1762.

lesions were found at necropsy in 26 per cent. of his cases of aneurysm of the aorta, and aneurysm was found in 18 of 96 cases of tabes.

The finding of the Wassermann reaction in the blood in late syphilis suggests the possibility of tabes or paresis in those who have shown no signs of either disease, whereas a negative finding is indicative of exemption from these diseases. Patients with late syphilis should have the blood examined, and if the reaction be positive, antisyphilitic treatment should be employed, as Lesser has shown that by this treatment a positive reaction may be changed to a negative.

The results which Eichelberg¹ obtains after an extensive experimental study of the serum reaction of syphilis are as follows: The Wassermann reaction is from a scientific standpoint a very interesting phenomenon, for which a theoretical foundation has not been found, as the original interpretation must be abandoned.

The reaction occurs very frequently, but not invariably, in the blood serum of those who have or have had syphilis, also in paralytics and tabetics. It is obtained also with the spinal fluid of those who have paresis, tabes, or syphilis. It is obtained also in different protozoan diseases, in scarlet fever and idiopathic epilepsy, and in exceptional instances in pneumonia, typhoid fever, tuberculosis, diabetes, and tumor.

The reaction does not furnish a positive proof that tabes and paresis are syphilitic diseases, as the original theories have been demonstrated to be incorrect. Its frequent occurrence in syphilis, paresis, and tabes is clinically of importance in connection with other facts which speak for the connection of paresis and tabes with syphilis.

It is a reaction of practical value to a certain extent, in the diagnosis of syphilis. When obtained with the spinal fluid, it is of diagnostic importance for tabes and paresis. It gives no indication as to whether the syphilis is cured or not, and is, therefore, of no value as regards antisyphilitic treatment.

ABORTIVE TABES. Achard and Foix² have raised an interesting discussion on tabes by reporting a case in which the only signs were some pain in the limbs, gastric crises, vesical symptoms, and lymphocytosis of the cerebrospinal fluid obtained by lumbar puncture. Dejerine believes that the reaction to light may be slow during the gastric crises when it is normal during the intervals, and this without the administration of morphine. Babinski thinks, however, that morphine produces the change in the pupillary activity. Sicard doubts whether gastric crises and lymphocytosis of the cerebrospinal fluid are sufficient without other signs to justify a diagnosis of tabes. While some of the speakers expressed themselves in favor of antisyphilitic treatment, at least in the early stage of tabes, others were skeptical regarding its efficacy.

¹ *Deutsche Zeitschrift f. Nervenheilkunde*, vol. xxxvi, Nos. 3 and 4, p. 319.

² *Revue Neurologique*, November 30, 1908, p. 2030.

Brissaud does not regard loss of tendon reflexes with lymphocytosis of the cerebrospinal fluid as sufficient for a diagnosis of tabes, and he never advises antisyphilitic treatment in advanced cases of tabes, but does so in the uncertain forms.

LIGHT REFLEX IN TABES. The views of Bumke as to the extent of the retina concerned in the pupillary reflex were that the centre of the retina is most active in this reflex, but the periphery also shares in the function. Hess concluded that only the perimacular region, about 3 mm. in width, contains pupillomotor fibers. Veraguth¹ offers an important contribution to this subject. A man had as a result of trauma only a small portion of the peripheral retina in the right eye retaining vision. When light was thrown into this eye no contraction of the pupil occurred in either eye, but when light was thrown into the left eye, the pupil in each eye contracted. He concludes from this that the centripetal portion of the light reflex arc was destroyed in the right eye, notwithstanding the small patch of retina with retained vision, and that impairment of the central or centrifugal portion of the reflex arc did not exist, and that the retained portion of the retina did not contain any pupillomotor fibers, as it did not extend to the perimacular zone.

GASTRIC CRISES. Gastric crises seldom lead to a diagnosis of intestinal obstruction, although more frequently they have caused a mistaken diagnosis of gastric ulcer. Dufour and Cottenot² report the case of a woman who was seized suddenly with vomiting of bile following a period of constipation. She was taken to a hospital, where the diagnosis of intestinal obstruction was made, and an artificial anus was made in the left iliac fossa. The patient left the hospital three weeks later cured. The severe vomiting returned later, and Dufour and Cottenot discovered that the patient had tabes, shown by inequality of the pupils, loss of patellar and Achilles reflexes, dissociation of sensation in the lower limbs, incoördination, etc. They refer to a case that one of them had seen, a man with tabes, who was operated upon for supposed appendicitis.

Gastric crises in tabes are not usually associated with the vomiting of blood. Charcot and Vulpian each described a case of this kind. Kollarits³ gives the report of a case in which during the late stage of tabes the vomiting of blood and occasionally blood in the stool occurred. The suspicion of ulcer or carcinoma was aroused because of the intensity of the hemorrhage. No ulcerations were found in the stomach or intestines at the necropsy.

Ostankow⁴ believes that morphine and other derivatives of opium, as heroin, may when given repeatedly in tabes produce true gastric crises, associated with an increase in temperature and a decrease in the

¹ *Neurologisches Centralblatt*, May 1, 1908, p. 402.

² *Revue Neurologique*, March 30, 1909, p. 365.

³ *Neurologisches Centralblatt*, January 2, 1909, p. 11.

⁴ *Ibid.*, p. 14.

amount of urine. Morphine and other drugs, as antipyrine, phenacetin, asperin, used constantly to relieve pain, may temporarily arrest the crises and shooting pains of tabes, but may cause recurrence of the attacks in increased intensity.

Conzen¹ has observed *uterine crises* in tabes resembling closely labor pains.

MOTOR SIGNS IN TABES. Implication of motor cranial nerves is by no means common in tabes, and therefore the case reported by Souques and Chéné² is interesting. These authors observed disturbance in the motor trigeminal, the vagal, the spinal accessory, the hypoglossal nerves, and the inferior roots of the brachial plexus. All the muscles innervated by the motor branch of the fifth nerve were atrophied, while the sensory branch seemed to be intact. Taste was preserved in the posterior and anterior part of the tongue, and the sensory part of the glossopharyngeus presumably was intact, although the sensory distribution of this nerve is uncertain.

Probably, in the author's opinion, only this nerve furnishes the reflex sensibility of the pharynx. One may well question whether this is not also by means of the vagus. The disturbance of the vagus was shown by hemianesthesia of the pharynx, interference with respiration, acceleration of the pulse, paralysis of the left vocal cord, and hemiparesis of the soft palate. The external branch of the spinal accessory nerve was affected, as shown by atrophy of the trapezius and sternocleidomastoid muscles. Hemiatrophy of the tongue indicated that the hypoglossal nerve was diseased. The paralysis of the lower roots of the brachial plexus was accompanied by oculopupillary signs.

This case seems to be unique, in that it alone has presented bulbopontile lesions with brachial plexus palsy in tabes. No necropsies have been obtained in any case resembling that of Souques and Chéné, but it is possible that the involvement of bulbopontile nerves may be through a meningitis associated with tabes.

Gilbert, Carnot, and Descomps³ have observed a case of tabes in which sudden paralysis of the right upper limb occurred, without any apparent cause, and which disappeared completely after three months. A month later another paralysis developed, localized this time in the left upper limb and implicating only the biceps and brachialis anticus. There was no history of trauma or pressure obtainable. Such palsy might be caused by peripheral neuritis or anterior radiculitis. It is questionable whether the relation of cause and effect between the tabes and the paralysis existed in this case, or whether the occurrence of the two conditions was a mere coincidence. The authors incline to the former view, and compare the brachial palsy with the ocular palsies occurring not infrequently in tabes.

¹ Neurologisches Centralblatt, January 2, 1909, p. 18.

² Revue Neurologique, March 15, 1909, p. 249. ³ Ibid., March 30, 1909, p. 375.

SACRAL TABES. Cases of sacral tabes with necropsy are not numerous in the literature. Leopold¹ has found two similar cases to the one he reports. In his case the patellar reflexes were preserved, although the Achilles reflexes were lost. The microscopic examination showed that the posterior roots between the second and fourth lumbar segments, inclusive, were only slightly degenerated. Leopold emphasizes the importance of the loss of the Achilles tendon reflex in tabes, and it is undoubtedly true that as much, or nearly as much, can be learned from the condition of this reflex as from the condition of the patellar reflex.

TABES AND ACROMEGALY. In a peculiar case of tabes observed by Dercum² symptoms of acromegaly developed. The countenance of the patient seemed to have become lengthened. The chin was enlarged and protruding, the nose was prominent and large, as were also the zygomatic arches and the occipital protuberance. The hands and wrists, also the metacarpal bones and middle phalanges, were enlarged. Both feet were flattened and unusually broad. The internal condyle of each knee was thickened.

At the necropsy the pituitary body was found to be fully twice as large as it should be, and the lesions of tabes were present. The adrenals showed simple hypertrophy with fatty change in the zona fasciculata. Dercum believes that possibly in cases of tabes where there are marked trophic changes in the bones, there is also alteration of the pituitary body, and this gland and other ductless glands should be examined.

Spinal Tumor. Krause³ reports his results in twenty-six cases of compression of the spinal cord from growths or cysts within the vertebral or dural canal. In one case he operated upon seven vertebræ without greatly weakening the vertebral column. He urges the opening of the spinal dura in most cases. He has operated in two cases on the spinal cord itself by making a long incision in the posterior commissure (presumably septum is meant), and each time with recovery. In one case a cyst the size of a pea was found; in the other, a small area of softening.

The case of *tumor of the cauda equina* reported by Klieneberger⁴ is interesting because of the improvement following operation, although it is not as yet known whether this was of long duration. The growth was a fibroma with the appearance of angiosarcoma in certain regions. Recurrence is much to be dreaded, but the surgical intervention was beneficial, and unfortunately this cannot be said of many cases of tumor of the cauda equina.

Oppenheim⁵ discusses the condition of the patient after operative removal of spinal tumor. The result depends on the position of the

¹ Journal of Nervous and Mental Disease, April, 1909, p. 193.

² Ibid., 1908, p. 507.

³ Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxvi, Nos. 1 and 2.

⁴ Monatsschrift f. Psychiatrie und Neurologie, August, 1908, p. 97.

⁵ Neurologisches Centralblatt, March 16, 1909, p. 290.

tumor, the size, etc. It is a more serious procedure to remove a tumor on the anterior part of the cord than one on the posterior part, as in the former position the cord must be displaced by the operator. In some cases roots are stretched or divided, and this complicates the operation. The cystitis, decubitus, etc., influence the results. The symptoms may become more intense after the removal of the tumor; weakness may become complete paralysis, and spasticity yield to flaccidity. Such symptoms indicate serious implication of the spinal cord, possibly from the surgeon's technique. The improvement may begin within a few days following the operation. The bladder condition may be the first to improve, and voluntary micturition may return. Sensation is likely to be recovered more rapidly than motion.

In some instances disturbing symptoms develop after improvement has begun and has even progressed considerably. Retention of urine, spasticity, pains, etc., recur, and even cerebral symptoms may be added. While purulent meningitis may be the cause of all this, more often it is the serous form of meningitis. The operation has acted as an irritant, and the amount of cerebrospinal fluid has been increased, and as it is not removed sufficiently rapidly, it causes pressure upon the spinal cord and roots. As certain symptoms disappear others that were masked by them reappear; thus, when the lateral and posterior columns are both affected, the return of motion as the lateral columns recover may allow the ataxia from implication of the posterior columns to appear. Usually a half year is requisite for recovery after operation.

The case of *tumor of the spinal column* reported by Ewald and Winckler¹ is important because of the rapidity of the paralysis. The patient had complained of severe pain between the shoulders, but was able to continue at his work. On a certain day he suddenly noticed that he could not move his lower limbs properly, and could not pass urine, but the following day was able to walk with support. A sarcoma was found at the cervicothoracic junction, inside the vertebræ, and external to the cord, and numerous small hemorrhages were seen in the transverse section of the spinal cord. The case during the life of the patient was regarded as one of transverse myelitis. It has much resemblance to a case reported by Nonne. It is not improbable that the rapid paraplegia was caused by the intramedullary hemorrhages. The important lesson to be derived from this case is that sudden paralysis may be produced by extramedullary tumor, and the difficulty in diagnosing between such a growth and acute myelitis is emphasized. In some cases a positive clinical diagnosis seems impossible.

Under the title of *strangulation of the cauda equina*, Oppenheim and Krause² describe two important cases. In one the operation revealed narrowing of the vertebral canal at the fourth lumbar vertebra. The

¹ Berliner klinische Wochenschrift, March 22, 1909, p. 529.

² Deutsche med. Wochenschrift, April 22, 1909, p. 697.

bone at this region was so enlarged as to cause contraction of the vertebral canal.

In the second case, reported in detail, the patient occasionally had had for a number of years, pain and paresthesia, and some impairment of motion in the lower limbs after exertion, as in lifting. Symptoms of a high cauda equina lesion were present, and the diagnosis of spinal tumor was made. The symptoms indicated that the seat of the lesion was at the third lumbar vertebra. The vertebral canal was found narrowed here by an enchondroma growing from the body of this vertebra. The dura was distended above this lesion. The tumor tissue was removed so far as it was recognizable. The pain and paresthesia disappeared, but certain symptoms persisted.

The condition these authors describe is one in which, after relatively unimportant symptoms, signs of acute compression develop after violent muscular action. The cauda roots are compressed at the constriction and are pushed apart above this region. This displacement is probably produced by the bending of the body and thereby crowding of the cauda roots above the constriction, with inability of these roots to return to their normal position. Following this, an accumulation of cerebro-spinal fluid occurs above the compression.

Hemorrhage into the Cord. A remarkable case of hemorrhage into the spinal cord is described by Winkler and Jochmann.¹ The hemorrhage was spindle-shaped, had its greatest size in the lower cervical and upper thoracic areas, and extended into the lumbar region at one end and into the upper cervical region at the other. The paralysis developed gradually instead of suddenly, as is usually the case after trauma. In the days immediately following the accident walking became difficult, but the man could still walk, although with difficulty, after two months. Complete paraplegia of the lower limbs developed shortly before death, and the paralysis extended to the trunk and upper limbs. Death probably occurred by paralysis of respiration. The authors believe that successive hemorrhages occurred. The diagnosis during life was acute myelitis.

A second case described by these writers is interesting in that after a fall, at five o'clock one afternoon, no severe symptoms developed until nine o'clock the next morning, when paralysis of all four limbs occurred within a few hours. The necropsy was made about eighteen months later, and revealed a stretching or tearing of the cord in the lower cervical region. In neither case was the spinal column injured, and the cases are important in this respect.

HEMORRHAGE OF SPINAL MENINGES. A condition concerning which we know very little is non-traumatic hemorrhage in the spinal meninges. Renault² describes a case in which severe lumbar pain developed suddenly

¹ Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxv, Nos. 3 and 4, p. 222.

² Semaine Médicale, July 29, 1908.

and radiated into the lower limbs, and was accompanied by rigidity of the back. Two days later the neck became stiff, and the patient, a man, aged twenty-five years, had headache, vertigo, and vomiting. Lumbar puncture revealed blood in the cerebrospinal fluid, which became less distinct after repeated punctures. Complete recovery occurred. The treatment in such a case as this is lumbar puncture.

Spastic Paraplegia. It has probably occurred to many that cutting the posterior roots would diminish spasticity, but the fear that serious consequences might result from the operation has held me back. O. Förster,¹ however, has had this operation performed in three cases with success, in one with failure. Only severe cases of spasticity are suitable for this operation. He recommends that the dural cavity should be exposed from the second to the fifth lumbar vertebra, including the upper part of the sacrum. The first sacral root leaves the inner surface of the dura exactly at the level of the spinous process of the fifth lumbar vertebra, and this is a valuable fact in determining the roots exposed. No muscle group is supplied entirely from one spinal segment. Alternate roots should be cut, as in this way complete loss of function does not occur.

Syringomyelia. Marie and Guillain have described as spasmodic syringomyelia a form in which the arms are firmly held to the anterior part of the thorax, the hands nearly meeting in front of the body, the shoulders raised and inclined forward and downward, the back rounded; the whole picture presenting somewhat the appearance of paralysis agitans. The hands show a marked spastic flexion of the last three fingers into the palm, the thumb and forefinger are extended and slightly flexed toward one another. The upper limbs are extremely spastic; the lower limbs also are spastic. The deep reflexes are exaggerated and Babinski's reflex is obtained. The condition develops slowly.

Guillain collected five cases. A few others have been reported since, and Alexander Bruce² adds another. In his case only one upper limb was affected, and the little finger was not flexed into the palm as in Guillain's cases. The patient had indefinite varying dissociation symptoms in the affected upper limb. Remarkable was the absence of alteration in the gait or in the reflexes, or tonicity of the lower limbs. The absence of pathological study in this case makes an explanation difficult.

Trichosis Occurring with Syringomyelia. Gowers³ refers to the occasional occurrence of abdominal growth of hair across the lumbar region in cases of spina bifida occulta, and reports a case in which a similar growth was found in association with syringomyelia. The

¹ Zeitschrift f. Orthopädische Chirurgie, vol. xxii, p. 203.

² Review of Neurology and Psychiatry, July, 1908.

³ Medico-Chirurgical Transactions, vol. xc.

patient, a man, presented a mass of hair in the cervical region, strictly unilateral, close to the spinal column, and limited by the middle line. It was associated with symptoms indicating syringomyelia of the same side. The case was a clinical one, and no satisfactory explanation for the growth of hair could be given.

Combined System Disease. Many cases of combined system disease have been regarded as examples of primary degeneration of certain tracts of the spinal cord, distinct from the pseudosystemic forms. Unquestionably the hereditary types are different, but the distinctions advanced for the other types are often forced and unconvincing. It is, therefore, with some degree of satisfaction that we find Nonne and Freund taking the stand that no essential difference exists between the acquired forms of combined system disease, and that all are the result of multiple foci of degeneration in the spinal cord. The examination of many such cases has led me to the same conclusion as that reached by Nonne and Freund.¹

Poliomyelitis. M. Allen Starr² has made a useful resume of the reports of epidemics of acute anterior poliomyelitis in the literature. There has been recently a severe epidemic of this disease in Eastern cities, and in the cases observed by Starr pain has been a prominent symptom. Some abortive cases have occurred in which the palsy was not more than a sense of fatigue, and the result has been complete recovery. On the other hand, very rapidly fatal cases were observed, and the mortality has amounted to 7 per cent. Martha Wollstein, at the Rockefeller Institute, was unable to find a specific microorganism in the cerebrospinal fluid removed from a number of cases. Starr's treatment in the early stage of the disease consists of dry cups or ice-bags along the spine, acetanilid or some similar drug to relieve pain, a brisk purgative, urotropin to cause the presence of formaldehyde in the cerebrospinal fluid, salicylate of strontium, and later strychnine, massage, electricity, etc.

Openshaw³ has reported a case of severe infantile paralysis of the right lower extremity, with recovery of power and substance, in the quadriceps muscles after atrophy lasting twelve years. For eleven years the man had not the least power to extend the knee, but during the past four years he has gradually recovered power, and at the present time has a fairly developed quadriceps muscle. The return of power was attributed to early application of braces and continued use of the limb in walking.

Openshaw believes that for recovery of power in this disease it is imperative to set the patient erect upon his feet as early as possible. The frequent attempt to walk made by the patients constitutes the safest

¹ Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxv, Nos. 1 and 2, p. 102.

² Journal of the American Medical Association, July 11, 1908, p. 112.

³ Proceedings of the Royal Society of Medicine, January, 1909.

and best stimulus which can be sent to the muscles, and may induce contraction in these weakened and paralytic muscles, and so bring about restoration of function and increased growth.

CHRONIC ANTERIOR POLIOMYELITIS. Cases of this disorder with necropsy are rare and all are of value, as the distinctions between chronic poliomyelitis and progressive spinal muscular atrophy are not sharp. A recent contribution to the subject is made by Cassirer and Maas.¹ Their patient was a woman, aged sixty years, in whom weakness of the lower limbs developed quite rapidly. Three years after the first appearance of symptoms almost complete paralysis was found in the lower limbs, trunk, hands, and forearms, while the upper arms were paretic. The other muscles escaped. The muscles first affected were greatly atrophied, and the limbs were in hypotonia with lost tendon reflexes. Sensory symptoms were practically absent. The nerve cells of the anterior horns and the intramedullary portion of the anterior roots were much altered. Foci of atrophied fibers, with proliferation of the glia, were found in the lateral columns, but the alteration was not intense. It is remarkable that in all the reported cases of chronic anterior poliomyelitis some change was found in the lateral columns. These authors believe that the chronic, as well as the acute form of poliomyelitis, is of vascular origin.

SYPHILITIC POLIOMYELITIS. Disease of the anterior horns has been observed in syphilis, but what seems to have been the only case of acute syphilitic poliomyelitis on record has been described by Preobraschenski.² His patient, a woman, aged forty-six years, became paralyzed in all her limbs within a few days. The paralysis was flaccid, with lost tendon reflexes, but without sensory disturbances. The bladder was at first affected, but the cranial nerves escaped, except that the light reflex was lost. Atrophy developed in the affected muscles. The woman lived a little over two months. The anterior horns were diseased from the cervical swelling throughout the cord. There were also round-cell infiltration and disease of vessels. Syphilitic acute poliomyelitis, therefore, exists, but is likely to be associated with cerebral symptoms.

Nerve Transplantation. The results of nerve transplantation or nerve anastomosis have not been altogether favorable, and a recent experiment of Bikeles³ gives a reason for this. He cut certain nerves in one leg of a dog and inserted the peripheral ends into a healthy nerve without dividing its fibers transversely. In another leg of the same dog he cut nerves completely across, and anastomosed the central end of one with the peripheral end of the other. The dog was allowed to live 294 days after the first operation and 210 days after the second, in order to permit

¹ *Monatsschrift f. Psychiatrie und Neurologie*, October, 1908, p. 306.

² *Neurologisches Centralblatt*, November 16, 1908, p. 1069.

³ *Ibid.*, May 16, 1908, p. 450.

regeneration to occur. The peripheral ends were then divided below their points of union with the other nerves.

It is well known that reaction at distance occurs in nerve cells when their nerve fibers are injured, and in this experiment, if physiological union had occurred in all the nerves operated upon, this reaction should have been detected in both sides of the cord after the final division of the nerves. It occurred, however, only on the side of the end to end anastomosis, thus showing that if we hope to obtain physiological union of a diseased with a healthy nerve we must do more than make an end-to-side anastomosis, but must cut healthy fibers transversely and bring them into intimate relation with the diseased fibers. This fact is important as regards the treatment of poliomyelitis by nerve transplantation.

Multiple Sclerosis. The conclusions to which Woods and I¹ have come regarding the relation of syphilis to multiple sclerosis are:

1. Syphilis may in rare instances produce a symptomatology indistinguishable from that of typical multiple sclerosis, and this without the formation of sclerotic plaques, but by the ordinary lesions of syphilis, viz., arteritis and meningitis.

2. Syphilis may produce sclerotic plaques in the spinal cord resembling those of multiple sclerosis, without producing the typical symptoms of this disease. These plaques have not the sharp definition seen in most cases of typical multiple sclerosis, and yet multiple sclerosis may exist without plaques sharply defined from the normal tissue. The syphilitic form of multiple sclerosis presents round-cell infiltration of the pia and thickening of the bloodvessels. Thickened vessels with a small amount of perivascular sclerosis will usually be found in certain regions without the formation of plaques, though plaques may be present at other levels of the cord. In some places slight neuroglial proliferation without thickened vessels may be detected, resembling in no way true plaque formation, but appearing more in the nature of slight diffuse secondary degeneration. Gumma also may occur in the brain. Secondary degeneration is more common in the syphilitic type, but does occur rarely in multiple sclerosis. Nerve fibers are not always completely degenerated in the syphilitic plaques. Careful and thorough examination will almost always, if not always, make a diagnosis possible between the lesions of syphilis and those of multiple sclerosis, even though they may have a decided superficial resemblance.

We reported a case of syphilis which in its lesions resembled multiple sclerosis, but did not present the symptoms of the latter disease. Even from the lesions the differential diagnosis was possible.

¹ University of Pennsylvania Medical Bulletin, March, 1909.

DISEASES OF THE NERVES.

Diabetic Neuritis. It seems probable from the investigation by L. Bruns¹ of twenty-three cases of his own that the neuritis of diabetes is almost always confined to the lower limbs, and that it is especially common in the lumbar nerves. The development and course of the diabetic neuritis is by no means proportional to the amount of sugar in the urine. When by proper diet the sugar is made to disappear, neuralgia usually ceases, but the paralysis diminishes slowly. The paralysis may disappear even while sugar is present in the urine, and in other cases the neuritis may disappear after the disappearance of the sugar and reappear in other parts without any reappearance of sugar in the urine.

Ascending Neuritis. The occurrence of ascending neuritis is not accepted by all. The subject has been under dispute for a long time, and the conflicting opinions are given by G. C. Bolten.² This author reports five cases; in three of these there were suppurating wounds of the skin, in one a trauma without external injury, and in another a wound with infection of the ulnar nerve. He regards the condition as rather common, and yet he states that he has had only five cases in a practice of ten years' duration. He emphasizes what Oppenheim had previously pointed out, viz., that traumatic hysteria may closely resemble ascending neuritis following a wound, but in the former there are never true reaction of degeneration and swelling with tenderness of the nerve trunks.

Joint disorders, Bolten agrees with Remak, occur in neuritis of traumatic origin with infection, and never in neuritis of toxic or other origin.

Neuritis from Appendicitis. Some attention has been paid to neuritis occurring during appendicitis, and a few cases are on record; one of the most recent is that of Courtellemont.³ The neuritis may be local from extension of the inflammation to the anterior crural nerve, or may be from general infection. There is, at least, one case on record (Monsk) in which anterior poliomyelitis seemed to follow appendicitis.

Sciatica. J. Brindley James⁴ has much faith in the treatment of sciatica by *injections of ether*, and his statements seem reasonable. The method is not unlike the injection of alcohol into nerves to relieve pain. He begins by injecting, subcutaneously, sulphuric ether and cocaine or morphine, once a day, into the sciatic nerve with a needle $2\frac{1}{2}$ inches long, after marking out the position of the nerve by measurement and

¹ Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxvi, p. 17.

² Berliner klinische Wochenschrift, September 28, 1908, p. 1758.

³ Revue Neurologique, November 30, 1908, p. 2023.

⁴ Lancet, October 10, 1908, p. 1080.

touch. Unless the patient involuntarily shoots out his leg the nerve has not been touched.

One may well fear the production of a paralysis in the sciatic distribution by this method, but it may be temporary.

Facial Palsy. A very interesting investigation of facial palsy has been made by Bruce and Pirie.¹ They give the views regarding the origin of the upper branch of the facial nerve from the lower part of the oculomotor nucleus, and of the origin of the fibers to the orbicularis oris from the upper part of the hypoglossal nucleus. They have found that the immunity of the upper facial muscles in bulbar palsy and amyotrophic lateral paralysis is not so complete as it appears to be, and that though the upper facial muscles may not appear paretic in these disorders, they may show as great or nearly as great a degree of reaction of degeneration as the lower facial supply. In a case studied by them, in which complete left facial palsy was present, no degeneration was found in the facial nucleus of the opposite side, which indicates that the facial fibers do not decussate. The hypoglossus nuclei were intact, therefore the lip fibers could not have arisen in these nuclei. No degeneration was found in the oculomotor nuclei. They conclude:

1. That the upper facial nerve does not arise from the oculomotor nucleus.
2. That the lip-facial fibers do not arise from the hypoglossal nucleus.
3. That there is no crossed origin of the facial nerve from the main nucleus.
4. That no crossed origin for any of the fibers has yet been discovered.
5. That all the fibers of the facial nerve arise from the groups of cells in the pons behind the superior olive, known generally as its main nucleus, the upper facial branch probably arising from the dorsal part of the nucleus.

Waterman² has studied 335 cases of facial palsy, all being cases of the neuritic type. The variation between the sexes he finds is so slight that it needs no consideration, 191 males being affected and 144 females; 52 per cent. were males and 48 per cent. females in the combined statistics he employed. There seems also to be very little difference as regards frequency in right-sided and left-sided palsy. Many inquiries have led Waterman to believe that neuropathic relatives are no more frequent in families of those stricken with facial paralysis than are found in families taken at random. He has twice seen palsy follow emotional excitement, but such instances are exceptional and may be regarded more in the nature of a coincidence than as illustrative that emotional disturbance is a cause of facial palsy.

In twenty-two cases he has received reports from aurists when the examination was made during the first seven days of the palsy, in

¹ Review of Neurology and Psychiatry, December, 1908.

² Journal of Nervous and Mental Disease, 1909, p. 65.

nineteen the middle ear was normal, and in three a mild degree of congestion was found. There is no doubt that exposure to cold winds and draughts plays a part in the causation of an attack. He accepts the possibility that some toxic substance may affect the nerve, as retro-bulbar optic neuritis has been observed in individuals who have previously been affected with facial palsy. The degree of cold is not the important factor in the causation of facial paralysis, as the average of the different months seems to be almost uniform; the mild cases are not more frequent in summer nor the severe ones more numerous in the winter months. The greater percentage of severe attacks seems to be between the ages of forty and sixty.

Occupation Neuritis of the Deep Palmar Branch of the Ulnar Nerve. Hunt¹ describes under the above heading a group of cases presenting the following clinical characteristics: An atrophic paralysis of all the intrinsic muscles of the hand innervated by the ulnar nerve; the electrical reactions of degeneration; no objective sensory disturbances in the ulnar distribution. The absence of sensory symptoms and the sharp limitation of the paralysis, atrophy and electrical changes to the muscles of the hand supplied by the ulnar nerve distinguish this type of occupation palsy.

The condition resembles the Aran-Duchenne atrophy, but is unilateral. The compression takes place before the deep branch of the ulnar nerve breaks up into its numerous branches, which begins immediately the nerve trunk has passed between the tendons of origin of the abductor and the flexor brevis minimi digiti.

Ulnar Palsy following Typhoid Fever. Since the publication of the cases by Nothnagel, in 1872, of ulnar palsy following typhoid fever, a number of similar observations have been made. A recent study of the subject is by Lasarew.² He states that the palsy usually appears in convalescence after a severe form of typhoid fever, although it has occurred after a mild attack. All the muscles or only a part of the ulnar distribution may be affected. Complete paralysis is rare. Sensation and electrical reactions are usually affected.

It seems to me questionable whether this ulnar palsy can be directly attributed to the fever. Pressure upon the elbow, and thereby pressure upon the ulnar nerve, may readily occur during the delirium, the alcohol used so frequently in the disease may assist the poison of typhoid fever in rendering the nerves more liable to degeneration, and the affection of the ulnar nerve may then be brought about by pressure. I have seen grave ulnar neuritis follow an abdominal operation in a young man who was alcoholic. Here the pressure upon the elbow that probably occurred during the surgical intervention was sufficient in con-

¹ Journal of Nervous and Mental Disease, 1908, p. 673.

² Monatsschrift f. Psychiatrie und Neurologie, April, 1909, vol. xxv, p. 327, No. 4.

nection with the alcoholism to produce serious results. A man who is the subject of chronic alcoholism may have a mononeuritis from what seems almost a trivial cause.

MISCELLANEOUS NERVOUS DISEASES.

Heredity in Acquired Epilepsy. Regarding acquired epilepsy Gowers¹ says he has always acted on the belief that the tendency to convulsion in such cases, without other evidence of disposition, may be regarded as not transmissible. He has never hesitated to permit the marriage of such an epileptic, and he has not had any evidence to show that he was wrong in doing so, however early in life the damage arose. He does not question the results obtained by Brown-Séquard on guinea-pigs; he questions an inference from guinea-pigs to man. Gowers adds, however, that cases of "organic epilepsy" are rare.

TOXIC EPILEPSY. There is much difference of opinion as regards the effect of alcohol on epilepsy, as to whether alcohol may produce the disease in a person without an epileptic taint, or whether it merely brings to light a latent epilepsy. Redlich² discusses this subject, and the following abstract of his views is published at the end of his paper.

There are certain cases of alcoholic epilepsy in which the abuse of spirits is the only excitant cause in a person disposed thereto, either through heredity or by a trauma. In other cases the use of alcohol may bring about epilepsy without predisposition, either in the form of true alcoholic epileptic fits appearing under the influence of intoxication, or in the form of genuine constitutional epilepsy, in which fits also appear, irrespective of alcohol being taken or not. There are also intermediate forms of these types. The author discusses especially alcoholic epilepsy. In this the epileptic attack may appear at the moment of maximal intoxication. Emotion and trauma of the head will increase the action of alcohol.

In some cases the fit occurs only during the postintoxication period, twelve, twenty-four, to forty-eight hours after the last dose of spirits. In common epilepsy the attacks very frequently appear at that time. Delirium tremens may simultaneously occur, and either this or epilepsy follow an alcoholic bout. These two conditions are closely related both in cause and character.

The author also discusses the question as to whether in such cases abstinence from alcohol may not cause fits, but he is not inclined to that view, since fits may appear while the intoxication is still in evidence. Here is a gap in our knowledge that no hypothesis at present fills.

¹ Proceedings of the Royal Society of Medicine, January, 1909.

² Epilepsia, January, 1909, vol. i, No. 1.

According to Kurt Mendel¹ toxic or infectious epilepsy (alcoholism, syphilis) may follow and be produced through trauma. Very rarely epileptic attacks may develop after injury of peripheral nerves, these are to be distinguished from those of genuine epilepsy, and are to be recognized as reflex epilepsy. A predisposition seems necessary for the occurrence of reflex epilepsy, and later this form of epilepsy may terminate in genuine epilepsy. Trauma may produce hysterio-epilepsy. Trauma is important in the etiology of genuine epilepsy, usually in association with hereditary tendency, alcoholism, lead, etc. It seems probable that the trauma in such cases plays a secondary role, or it may produce the epileptic tendency, which is then increased by other causes.

In some rare instances trauma seems to be effective without other cause in producing epilepsy, possibly by chronic meningitis; in other cases the brain probably is defective from birth. When epilepsy already exists a physical or mental trauma may produce an attack and intensify the epilepsy, in some cases after the epilepsy has been dormant for years.

Redlich² in a second paper discusses many interesting points relating to epilepsy, and shows how impossible it is to separate sharply the Jacksonian from the idiopathic form. The pathological findings in epilepsy are differently interpreted by the various investigators; what to one appears as cause is to another effect. He refers to cases of cerebral palsy of childhood, in which convulsions first appear after some trauma, intoxication, puberty, etc., and sometimes are more intense on the paralyzed side; to other cases in which when a portion of the motor cortex has been damaged or removed the convulsions do not affect the portion of the body previously innervated from this region. As a cause for the *epilepsia partialis continua* of Russian writers, in which constant clonic or fascicular twitchings of limited muscle areas occur during a prolonged period, Redlich mentions very intense and strongly circumscribed irritation of the motor cortex. One attack of epilepsy predisposes to another by raising the irritability of the cortex, probably by causing some histological change, and in this way epilepsy may be established. In treatment it is important to arrest the early attacks by drugs sufficiently powerful for the purpose.

Redlich favors excision of a small portion of the cortex in those cases in which the convulsions begin always in the same part, also the emptying of cysts in cerebral palsies, even the mere exposure of the brain; and he urges early operation where the cases are suitable, in order to avoid the cortical changes that repeated attacks produce. I think we may at present be somewhat conservative regarding such operations. Emptying of cysts associated with sclerosis of the cortex, excision of

¹ *Monatsschrift f. Psychiatrie und Neurologie*, June, 1908.

² *Deutsche Zeitschrift f. Nervenheilkunde*, vol. xxxvi, Nos. 3 and 4, p. 197.

small pieces of the cortex, and exposure of the brain have not given the satisfaction hoped for. Further observation is greatly needed.

UNILATERAL STATUS EPILEPTICUS. Unilateral convulsions may occur without macroscopic lesions, and may be in the form of status. In one case, reported by Hoppe,¹ the patient previously healthy had repeated attacks which began on the right side of the face, extended to the right upper and lower limbs, and then became general. No lesions could be found at the necropsy. Hoppe explains these unilateral convulsions by greater vulnerability of one cerebral hemisphere. His conclusion is important, as he says the most valuable lesson that is taught by these cases of status hemiepilepticus is the futility of surgical interference. In fact, the very character of these seizures in that they all resemble Jacksonian epilepsy, that they occur in individuals whose previous history has been negative, and that the attacks are frequent, is an indication against surgical procedure.

This is true of many cases, but I may state that more than once I have seen status hemiepilepticus produced by tumor of the brain. Other symptoms will usually be found in such cases, and the history of previous attacks will usually be obtained. We must share Hoppe's opinion when he says it is becoming more and more probable that there is a goodly number of borderland cases in which it is difficult to say, even after a long study of the case, whether the localized convulsion is caused by an organic lesion, whether it is to be regarded as a motor aura, whether it is to be classified as genuine epilepsy, whether it is purely a reflex contraction, or whether it is hysterical in character. Unquestionably every Jacksonian attack is not caused by a lesion of the motor area, and yet in many cases an organic lesion is present.

Hoppe believes that whenever loss of consciousness occurs first and convulsions follow, limited to a small group of muscles, the cases are epileptic in character and are not Jacksonian in type. These cases are not numerous and may at times be difficult to distinguish from hysteria. In some instances the convulsion is followed occasionally by a monoplegia, hemiplegia, aphasia, deafness, or other loss of function of the cortex of a focal character. These are cases of abortive epilepsy, as shown by the loss of consciousness preceding the convulsion. They are not suitable for surgical treatment.

Hoppe believes that if the objective examination be negative, especially in cases which have existed for years, there is no gross lesion of the brain. The idiopathic partial epilepsy shows no progression. The attacks always begin in the same way, and the secondary paresis never becomes permanent or progresses to a real paralysis. In the symptomatic Jacksonian attacks there is steady progression, the spasms have a gradual beginning, at first occurring at long intervals, and become gradually

¹ *Journal of Nervous and Mental Disease*, 1908, p. 737.

more frequent and more severe. The secondary paresis sooner or later becomes permanent, and objective signs point to organic change of the cortex. Hoppe's final conclusion is excellent in that he says that whenever a case of focal epilepsy becomes rapidly worse in the sense of numerous attacks of a violent character, and the individual's life is handicapped by the disease, and the medicinal treatment fails to give relief, an exploratory operation should be recommended in the hope of finding some local disease of the brain or its coverings. Whether the cortex should be removed is a debatable question.

Hysteria. BABINSKI'S VIEWS. The Neurological Society of Paris has devoted special meetings to the consideration of the new views on hysteria advanced by Babinski. The members agreed that there is a group of disturbances recognized as hysterical which may be produced by suggestion and dispelled by suggestion or persuasion, especially convulsive attacks, paralyses, contractures, anesthetics, hyperesthesias, disturbances of speech, of respiration, of digestion, etc. Babinski has examined about a hundred hysterical subjects, carefully avoiding all suggestion, and has not found any loss of sensation or of the special senses on one side of the body. All these persons had not been previously examined for nervous and ocular symptoms. We should not ask an hysterical patient "Do you feel distinctly?" or "Do you feel as well on this side as on the other?" That in itself is suggestion. Babinski closes the eyes of the patient and then requests him to indicate with his index finger where he has been touched. In examining for the visual fields the same precautions must be taken, and it must be remembered that the patient sometimes says he sees the testing object only when he has it in full vision.

The hysterical disturbances of sensation are unilateral, according to Thomas, because the examiner compares the two sides of the body and not the upper with the lower limbs. Meige thinks the hemianesthesia is usually on the left side because the examiner naturally touches the left side first, it being directly opposite his right hand. The opinion of most of the members of the society was that in the great majority of cases hemianesthesia and contraction of the visual fields are produced by suggestion, but some held that they were not always so produced. One may easily learn to control the pharyngeal reflex. This reflex should be regarded as the contraction of the pillars of the soft palate from irritation, not as the withdrawal of the head. Suggestion cannot abolish the tendon or cutaneous reflexes, but these reflexes may be prevented if the muscles concerned in them are under the control of volition.

No one in the society was able to state that circulatory, trophic, and secretory disturbances or fever could be produced by suggestion, but the members were divided as to whether these symptoms had any close relation to the contractures, anesthetics, etc., which they all

acknowledged might be caused by suggestion. Babinski remarked that the discussion had shown a remarkable change in the old conception of hysteria.¹

In the discussion it became evident that the persistence of hysterical contracture without retraction of tendons or of muscles during sleep could not be asserted. It became necessary to define the meaning of the term suggestion, and while some were inclined to attribute to it some evil insinuation, the decision was reached to speak of pathological suggestion either of good or bad import. Suggestion, as was pointed out, affects other conditions than hysteria, as in *maladie du doute*, *dé lire du toucher*, etc., and these conditions do not yield readily to persuasion, although prolonged psychotherapy may accomplish much.

The question of time is important. Hysterical manifestations may yield rapidly even immediately, to suggestion; whereas the doubts and fears of psychasthenia usually are affected very slowly by suggestion.

The morbid fears regarding the stomach, heart, or other viscera are sometimes produced by suggestion and cured by persuasion. Dejerine does not regard these as hysterical, but Babinski believes they are, and that they may be associated with neurasthenia. He does not accept Dejerine's view that hysterical people are never distressed by their hysterical defects, although he acknowledges that often they are not.

DIAGNOSTIC SIGNS OF HYSTERIA. A very interesting study of *muscular movements* has been made by Beavor,² and while it is difficult to discuss briefly the many interesting points of his paper, time must be taken to refer to his remarks on hysteria. In some unopposed movements, which are required to be stopped suddenly, Beavor states that the antagonists act, but do not in opposed movements. Sherrington has shown that electrical stimulation of the excitable cerebral cortex causes contraction of muscles taking part in the movement, and produces corresponding relaxation of the antagonists. Beavor has found that in many cases of functional paralysis an inability to inhibit the antagonists exists, and these muscles may contract first. Sherrington has found that in poisoning by strychnine or tetanus toxin the antagonists are excited as well as the muscles directly concerned in the movement.

It seems probable that in the absence of relaxation of the antagonists in hysteria we may have a valuable diagnostic sign between functional and organic palsies and contractures. The Paris Neurological Society acknowledged that suggestion plays an important part in hysterical contracture, but it seems hardly probable that the contracture of the antagonists is a result of suggestion.

According to C. F. Hoover,³ if a normal individual, lying on a couch, in the dorsal position with legs extended, lifts one foot, the heel of the

¹ *Revue Neurologique*, April 30, 1908, p. 375, and May 30, 1908, p. 494.

² *Journal of the American Medical Association*, July 11, 1908, p. 89.

³ *Ibid.*, August 29, 1908.

other foot always digs into the couch. This complementary opposition is felt by placing the hand under the tendo Achillis. In case of paralysis of one leg, due to an organic condition, if the patient attempt to lift the paralyzed foot there is the same complementary opposition, and the heel of the sound side digs into the couch. If the patient lift the sound foot, the complementary opposition of the paralyzed limb depends on its strength, and there will be no movement if that limb be completely paralyzed. Just the opposite takes place when the paralysis of the limb is hysterical or simulated. If the patient be told to lift the paralyzed leg, or to attempt to do so, no movement of the paralyzed limb will occur if the paralysis be complete, and no complementary action of the sound limb will occur. If the sound limb be lifted complementary opposition is exhibited in the paralyzed limb, and the heel digs into the couch.

Zenner¹ refers to this sign, and reports cases attesting its value.

Myohypotonia Congenita. In the study of congenital myohypotonia by Collier and Wilson² a careful study of the disease in its various aspects is made. They believe that a postnatal as well as a prenatal onset is possible, and in this they differ from most authors who consider the condition congenital. In support of their views they refer to a few cases in which the symptoms developed rapidly, probably as the result of some acute intoxication. It may be only a coincidence that in twenty-four cases, fourteen were males and ten females, at all events, the difference in the sexes is not very striking. These authors have not been able to find any trace of direct or indirect heredity, nor of any familial tendency in this disease.

One of the striking characteristics of the disease is the absence of local muscular atrophy which is common in muscular dystrophy. Collier and Wilson speak of the tendency for the hands and feet to be long and narrow, and the feet also pad-like. Contractures have occurred in a few of the cases.

They make the following distinctions between congenital myohypotonia and muscular dystrophy: there is no family tendency to the former disease, and myohypotonia has not as yet occurred in a myopathic family, and is usually congenital, which myopathy is not. The characteristic muscular flaccidity is not present in myopathy, whereas the local muscular atrophy is. The course of myohypotonia is toward improvement, possibly with return of the deep reflexes; that of myopathy is toward increase in intensity, and never with return of the deep reflexes. These authors, therefore, do not accept the opinion of some that the two disorders are manifestations of the same disease.

Another case of this disorder has been reported in this country by Orbison.³

¹ Journal of the American Medical Association, October 17, 1908.

² Brain, 1908, vol. xxxi, p. 1.

³ Journal of Nervous and Mental Disease, April, 1909.

Paralysis Agitans. Dyleff¹ has demonstrated that in Parkinson's disease the power of voluntary movement is diminished, while the resistance to passive movement is preserved, *i. e.*, the patient may, for example, be unable to squeeze the hand of the examiner with normal force, but may oppose passive movement with much power.

Among unusual symptoms of paralysis agitans, Pelz² describes excessive salivary secretion, tremor only on active movement, vitiligo, imperative micturition, and speech somewhat bulbar in character.

Kurt Mendel³ has continued his studies on the relation of trauma to organic nervous diseases, and in regard to paralysis agitans he expresses the opinion that trauma may produce the symptoms of this disease, and in many of the cases no other cause can be detected. A predisposition and a sufficiently advanced age seem to be necessary, in association with the trauma, for the production of the disease.

It is questionable whether fracture of bone is to be regarded as more liable to occur in Parkinson's disease than in health, but Monghal⁴ thinks it is, and has written his thesis on this subject. One patient after a slight fall felt his left leg give way under him, and found that he was unable to move it. He experienced no pain, either in active or passive movement, and palpation was not painful, although fracture of the tibia undoubtedly had occurred. The second patient had three fractures within six months without apparently sufficient cause. The author is inclined to attribute these fractures to lesions of the cells of the anterior horns of the spinal cord. Two cases are not sufficient to establish the tendency of paralysis agitans to cause fracture. Both patients were over sixty, and fracture is not a rare occurrence in elderly people who have not disease of the nervous system.

Facial Spasm. Patrick⁵ points out the distinctions between facial spasm and facial tic (motor tic). Both present an intermittent, painless twitching and contraction of facial muscles, both are or tend to become chronic, and both cease during sleep. Tic is much more common than spasm, and the patient is a nervous or neuropathic individual. Disposition or temperament appears to have nothing to do with spasm. Facial spasm is a real spasm pure and simple; an isolated disorder strictly confined to the mechanism of motor innervation of the face. Tic is not a spasm at all, but a volitional movement (even when automatic and subconscious), with extensive psychic and sensory associations. It is a motor obsession, or rather the motor expression, or result, of an obsession. Spasm is devoid of voluntary or involuntary control, while tic is always to some extent under the control of the will,

¹ *Revue Neurologique*, July 15, 1908, p. 680.

² *Neurologisches Centralblatt*, August 1, 1908, p. 720.

³ *Monatsschrift f. Psychiatrie und Neurologie*, May, 1908, p. 456.

⁴ *Semaine Médicale*, March 24, 1909, p. 138.

⁵ *Journal of Nervous and Mental Disease*, 1909, p. 1.

and always subject to involuntary control by strong emotional or intellectual preoccupation. Spasm is an anatomical, tic a physiological, disorder.

A good picture of facial spasm may be obtained by faradization of the facial nerve, and is not such as could be produced by voluntary contraction. Spasm at first is confined to part of the facial distribution, and never extends beyond the distribution of this nerve. In active experience, however, one will find that Patrick's distinctions do not always make decision as regards tic or spasm easy. There are cases where such distinction is extremely difficult or even impossible.

Patrick reports three cases of injection of the facial nerve with alcohol for the cure of facial spasm. The treatment seems to be very successful in this most annoying affection. It produces temporary facial paralysis, but as a patient of mine, who was operated upon by Frazier, told me, the palsy is more endurable than the spasm. Patrick is the first who has employed the treatment in America.

Tic and Spasmodic Torticollis. Patrick¹ draws in clear outlines the pictures of tic and chorea. I can hardly give the distinctions here, but his paper is an excellent presentation of the subject, and anyone likely to confuse the two disorders, radically different, will do well to read it. Especially interesting is what he has to say regarding spasmodic torticollis. Its relation to tic has been emphasized by French writers, notably Brissaud, but this is not always apparent. Patrick believes that the subject of spasmodic torticollis, as the subject of tic, is always a neuropath. He shows the same sort of abnormal susceptibility, the same psychomotor inability, the same lack of inhibition. The spasmodic torticollis has a sensory origin, and muscular rheumatism, the ordinary "stiff neck," is not rarely the origin of the trouble. The emotional state of the patient has much to do with the neck spasm. It is always worse when the patient is self-conscious or "upset." On the other hand, intense mental preoccupation may entirely abolish the trouble for a brief space. In torticollis there is the same strain in repressing the muscular drawings as in other tics, and the same sense of relief in yielding to the impulse. The muscular contractions of spasmodic torticollis are not true spasms, they are volitional. The patient invariably has some trick of restraint. A man whose neck muscles are twisting his head around with the greatest violence will gently place a finger against his chin or lay his palm over the occiput, when the muscles at once relax and the head assumes its normal position.

Presumably most physicians who have had much to do with spasmodic torticollis appreciate the correctness of this statement by Patrick. I have seen this simple contact of a finger with the cheek overcome the contraction. In one of my cases in which Dr. Frazier injected alcohol into the muscles of the neck improvement was decided.

¹ Journal of the American Medical Association, May 1, 1909, p. 1373.

Chorea. Burr,¹ in speaking of the mental state in *Sydenham's chorea*, separates the cases, so far as mental symptoms are concerned, into the following groups: (1) (And this includes a large majority) patients in whom there are peevishness, fretfulness, some loss of the power of fixing the attention, and a slight loss of the moral sense, shown by disobedience and selfishness; (2) those showing in addition to the above symptoms night terrors and transitory visual, auditory, or other hallucinations; (3) those with distinct delirium, wild or mild, accompanied by fever; (4) and this group is very small when we remember how common chorea is, those showing stupor or rather stupidity, and an acute dementia, which may follow the condition described under (3) or appear without any preceding mental symptoms at all severe, and which is usually accompanied with trouble in articulation, not caused by choreic movements of the lips and tongue, but is the result of mental hebetude. Fever is usually present for a time at least.

Patients of the first and second groups almost always recover mentally and physically; those of the third group frequently die, and those of the fourth usually either die or, recovering from the chorea, remain demented. The mental symptoms in chorea occur frequently after acute infectious fevers and sometimes primarily. Serious mental perturbation Burr does not regard as a part of the chorea, but as a secondary result; as an indication of the inability of the patient to stand the strain. The occurrence of chorea is a signal of possible danger to mental health in the future; as he puts it, every child who has had chorea needs the wisest and most careful teaching in self-control.

Emotional Ataxia. An interesting and rather common condition is described by Weir Mitchell² as emotional ataxy of a temporary character. One of his patients finds himself unable to write plainly in the presence of people who are overlooking him. To sign a hotel register or a business paper, when overlooked, results in the first letters of his name being correctly penned, and then in abrupt and excessive irregularity of the signature, and with the hand flying off at times across the page. On other occasions, the first effort to sign his name results in wild movements of an ataxic character, and in a signature that is practically unreadable. This same patient is obliged at times to leave a dinner table, as it is almost impossible for him to feed himself in the presence of strangers. Under extreme excitement his hand is steady, and a glass of whisky, or a glass or two of wine, puts an end to all his difficulties.

There are many persons who dislike to be under observation when signing their names. One man, to whom Weir Mitchell refers, found that if he expressed himself emotionally in a letter his writing became excursive and not merely tremulous. The fact of alcohol at once giving

¹ *Journal of Nervous and Mental Disease*, 1908, p. 353

² *Ibid.*, May, 1909.

certainly and abolishing the disturbance is interesting. The effect of emotion in the nervous is seen in other ways, as in the exaggeration of the knee-jerk, and a similar overflow of energy is responsible for the disturbance of certain normal voluntary actions of muscle groups.

PENMANSHIP STUTTERING. Under this designation, E. W. Scripture¹ describes a form of obsession or phobia sometimes occurring as regards writing, and mentions a case observed and treated by him. It has relation to the condition described by Weir Mitchell mentioned above. The patient was a man employed as a teller in a bank. He was able to write well when he could do so slowly and quietly. On entering the bank in the morning he was seized with a nervous fear and dread of writing poorly. The first few slips he wrote fairly well, but anxiety soon brought on a condition in which the writing grew worse with each word. The writing became more cramped and tremulous at the approach to the end of a word. He had suffered much on account of his writing, he had been passed over in promotions, and a nervous fear seized him the moment he took up a pen.

Methods similar to those used for stuttering speech were employed. Scripture sought a method of imparting thought by written characters that would involve graceful and easy movements of the right arm and hand. The method must be entirely different from penmanship, and yet capable of gradual change to it. Chinese writing brushes were bought and a new alphabet devised, which caused the letters to appear as hieroglyphs and to be felt as new things. In this way, a new means of communicating thought was built up which was disconnected from compulsive fear. When the man could write gracefully with a brush he was allowed to use a pen and draw the letters. Gradually the speed was increased and greater fluency obtained. It was constantly impressed upon the patient that he was writing in an entirely new way. Scripture believes that the principle of training a patient to use an entirely new set of thoughts and movements in accomplishing an act that has become disturbed through nervous troubles may be applicable in still other diseases, possibly in various phobias.

Associated Movements. These movements are always interesting in whatever combination they may occur. S. A. K. Wilson² describes curling backward of the helix of the pinna when the eyes are deviated strongly to one side. The movement is more pronounced in the homolateral ear, but occurs also in the heterolateral ear. As Wilson points out, associated movements of the eyes and ears are common in many animals, and when the eyes look in a certain direction the ear may be rotated to catch the sound. The movement that Wilson described is probably a remnant of an associated movement of widespread occurrence among the lower vertebrates.

¹ Journal of the American Medical Association, May 8, 1909, p. 1480.

² Review of Neurology and Psychiatry, June, 1908, p. 331.

Sym¹ discusses another form of associated movements. His patient had partial ptosis of the left upper eyelid. In chewing or singing the left upper eyelid sprang upward, disclosing about 3 mm. of white sclera above the corneoscleral junction. This condition had been present all the patient's life. The first case of this kind was described by Marcus Gunn in 1883. The explanation accepted by Sym is that some confusion occurs in the distribution of fibers and cells belonging to the fifth and third nuclei, so that the levator receives less than its normal innervation, and there may be a certain degree of ptosis without paralysis; at the same time the levator receives some fibers that were "intended for" the external pterygoid or digastric muscle, and when either of these muscles is put strongly into action the levator is unintentionally innervated.

Reflexes. *Von Bechterew's Flexor Reflex of the Toes.* In 1901, von Bechterew described a tarsophalangeal reflex consisting of slight flexion of the toes from percussion of the dorsal side of the tarsal and the bases of the metatarsal bones. He believed that it occurred only with pathological exaggeration of the reflexes. K. Mendel later described the same condition in spastic paralysis, and found that the reflex was most pronounced when the base and middle of the third and corresponding parts of the fourth metatarsal bones were percussed. In normal persons and those with functional diseases dorsal flexion of the second to the fifth toe occurred. Other writers have studied this reflex, and now Nikitin,² one of von Bechterew's assistants, makes a contribution to the subject. He advises that the percussion should be made in the middle of the outer part of the back of the foot. He studied thirty-five cases of paralysis with spasticity. Babinski's and von Bechterew's reflexes were both present in 57.1 per cent. of the cases. Babinski's reflex alone in 25.7 per cent., and von Bechterew's alone in 11.4 per cent.; both were absent in 5.7 per cent. The reflex seems to be especially valuable when the Babinski sign is not obtained.

The Babinski Reflex. In a few cases a plantar reflex has been obtained in one foot by irritation of the sole of the other foot (Babinski, Ganault), and Klippel, Weil, and Serguéeff³ have observed a case of hemiplegia with the Babinski reflex on the paralyzed side. Irritation of the opposite foot caused, however, flexion of the great toe on the paralyzed side. A satisfactory explanation for this phenomenon is not offered.

Heat Spasms. Edsall⁴ writes again on a peculiar spasmodic condition first reported by him in 1904. The spasms occur after exposure to severe heat, and are not associated with any of the generally recognized heat phenomena. Fibrillary contractions are conspicuous, especially

¹ Review of Neurology and Psychiatry, June, 1908, p. 337.

² Berliner klin. Wochenschrift, September 7, 1908, p. 1643.

³ Revue Neurologique, July 15, 1908, p. 690.

⁴ Journal of the American Medical Association, December 5, 1905, p. 1969.

in the calves, and are frequently interrupted by tonic spasms. The latter may last from half a minute to a minute each time they occur, and are exceedingly painful. They may involve the muscles of the forearms and legs, and the abdominal muscles severely. In their gross features the tonic spasms resemble tetany, but Chvosték's, Trousseau's, and Hoffmann's signs are absent. Extreme irritability of the muscles to direct stimulation is very striking.

While the spasms occur spontaneously with great frequency, they are excited in intervals of quiet by any attempt at voluntary use of the muscles. The spontaneous spasms may disappear within twenty-four hours, and leave merely slight exhaustion and some muscular soreness. The superficial and tendon reflexes are not exaggerated, and Babinski's sign is not present. Sensation remains normal, except slight tingling in the extremities after the spasms. Edsall's inquiries have revealed the fact that these peculiar spasms have been seen by many observers in persons exposed to great heat, and that their frequency seems to depend on the degree of heat and the amount of muscular labor performed by the men. The termination may be in death.

Periodic Paralysis. Bornstein¹ attempts to formulate a new theory as regards the origin of this malady. The disease is one affecting the anterior horns of the gray matter, occurring periodically, probably because of accumulating toxins which have a special tendency to affect the gray matter. He reports a case in which typical epileptic attacks with convulsions and unconsciousness occurred until the fourth year of life. Attacks of paroxysmal paralysis began at the eighth year of life, with flaccid hypotonic paralysis of all four extremities and trunk, and with cadaveric reaction in many muscles, without loss of consciousness. The patellar reflexes were exaggerated during the attack, while the Achilles and cutaneous reflexes were weak or lost.

He attempts to establish a relation between paroxysmal paralysis and epilepsy, and argues that both occur paroxysmally, the former is a disease of the gray matter of the spinal cord, the latter a disease of the gray matter of the brain. Paralysis may occur as an equivalent of the epileptic attack, and in his case and the case of Szachnowicz, one disease replaced the other. The cause of each is a toxin.

Graves' Disease. Kurt Mendel's² view regarding the relation of Graves' disease to trauma is that when a neuropathic disposition exists trauma may cause the first appearance of Graves' disease.

Prostatic Pain. A peculiar form of pain with hypertrophy of the prostate gland occurring on micturition has been observed by Bernhardt.³ The patient was a man between sixty and seventy years of age. The more common sensory symptoms of prostatic enlargement (pain in the

¹ Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxv, Nos. 5 and 6, p. 407.

² Monatsschrift f. Psychiatrie und Neurologie, June, 1908.

³ Neurologisches Centralblatt, March 16, 1909, p. 297.

penis, testicles, buttocks, upper limbs, and kidney region) were not observed. After the urine had been held a certain time at the moment of beginning urination occasionally peculiar painful sensations were felt in both hands and the lower third of each forearm on the radial side, corresponding to the sensory distribution of the musculocutaneous, radial, and median nerves. The sensation lasted five to ten seconds, and was felt in the back of the thumb, the thenar eminence, and possibly the first two or three fingers of the hand. The ulnar distribution seemed to escape.

Bernhardt discusses Head's work on referred pain, and also the radiation of pain beginning in one nerve territory to the territory of some other nerve, but concludes that neither phenomenon explains his peculiar observation. He can find no explanation for sensory disturbance in the territory of the sixth and seventh cervical segments from enlargement of the prostate, and he reports his case in the hope of obtaining light upon it.

Muscular Dystrophy. Gowers,¹ in speaking of the pseudohypertrophic form of muscular dystrophy, mentions that heredity is shown only by the maternal side, the tendency is a potential defect in that part of the ovum which will become the muscles of the male, but it is not in all the ova, as some sons escape. The female children seldom suffer, but they inherit the tendency, or some of them do, and their sons are prone to suffer. In the ova from which the daughters develop, the potentiality of the disease is not in the elements that develop into the muscles, but only in that portion of the protoplasm which will become their germinal tissue and form the muscles of male offspring. The same facts are true of other early atrophies, in hereditary optic nerve atrophy, etc. It would seem, therefore, that sex is also predetermined.

FAMILIAL MUSCULAR ATROPHY OF THE HANDS FROM CERVICAL RIBS. A peculiar family disorder from cervical ribs is described by Theodore Thompson.² Out of sixty-four individuals forming five generations of the same family, seven persons were affected with atrophy of the muscles of the hands. The author believed that the wasting of the hands was secondary, and was caused by the presence of the seventh cervical ribs which occur in families. He mentions the following possible objections to his views, viz.: That the condition was symmetrical, that the sensory changes were slightly marked, and that the radiographs were not conclusive.

The symptoms of cervical ribs are usually unilateral, but the deformity is commonly bilateral, and the symptoms may be so also. The wasting of the hands was not exactly symmetrical in Thompson's cases. In many of the reported cases of cervical ribs the sensory changes have

¹ Proceedings of the Royal Society of Medicine, January, 1909.

² Brain, 1908, vol. xxxi, p. 286.

been slight. Muscular atrophy may occur when the cervical ribs are small. The condition in Thompson's cases was not progressive; this and the absence of sensory changes make syringomyelia improbable.

Adenolipomatosis. A very extraordinary case of fat development was presented by C. K. Mills¹ before the Philadelphia Neurological Society. The disease began three or four years ago with a little swelling under the chin, which gradually increased in size. Later swellings began to appear at each breast around the nipple. Other swellings formed in the upper arms, sides of the chest and back, in the abdomen and thighs. The fatty masses varied in size from time to time, but the general tendency has been to increase. They caused no inconvenience except that of weight, and were not painful. At the time of presentation the patient, a man, had very large masses of fat in different portions of his body.

Mills regards the condition as allied to adiposis dolorosa, but differing in the absence of pain and marked asthenia. It is the adenolipomatosis of Launois and Bensaude. In some cases there is merely a median swelling beneath the chin. Two characteristics are almost always shown: The appearance of the swellings in symmetrical pairs or in the median line, and their having all the marks of diffuse lipomata. In the immense majority of the cases the lipomatous tumefactions constitute little more than a deformity; in addition to the mechanical discomfort which they occasion, they do not interfere seriously in the functions of the organism. It is possible that deeply situated masses of fat may form around the lymphatic tissue of the mediastinum and cause slight respiratory disturbance, hoarseness, cough, dilatation of the subcutaneous veins of the thorax, etc. At other times the symptoms are more threatening. Alcoholism may play an important part in the causation of the disease.

Rabies. Babes and Marinesco² have reported a case of paralysis following the Pasteur treatment for rabies. The patient, a woman, aged forty years, began treatment six days after being bitten. After fourteen days of the treatment paralysis of the lower limbs developed without any symptoms of hydrophobia. The paralysis ascended, and death soon resulted. At the necropsy the meninges and brain were edematous and the thoracic and lumbar segments of the cord were softened. Marinesco believes that these palsies following antirabic treatment are caused by a toxic substance in the material used, possibly because the nervous tissue of an animal remote from man is employed. These palsies fortunately are relatively rare, but when they occur they appear to be very serious.

The case of paralysis following the injections for rabies reported

¹ University of Pennsylvania Medical Bulletin, December, 1909, p. 286.

² Semaine Médicale, June 10, 1908, p. 287.

by Pfeilschmidt¹ is especially interesting because it is probable that an infection by rabies had not occurred. A student, after performing a necropsy on a dog dead from rabies, submitted himself to injections as a precautionary measure, although he had no wound. The symptoms were at first those of mild neuritis of the lower extremities and vesical disturbance; later, facial diplegia of the peripheral type developed and terminated in recovery. This observation shows that the injections for rabies may produce neuritis.

An abstract in the *Revue Neurologique* contains the account of two similar cases seen by Marinesco.² His paper is published in an inaccessible journal.

Another case of flaccid paraplegia occurring after the Pasteur treatment for rabies is reported by Simonin.³ The paralysis occurred on the fourth day of the treatment and after the seventh injection.

Myasthenia Gravis. The case reported by de Montet and Skop⁴ is interesting because of its long duration, twenty-three years, probably the longest on record, but especially because of the association with pronounced muscular atrophy, more intense in the upper extremities. Oppenheim does not recognize atrophy as a part of the symptom-complex. De Montet and Skop do not know how to explain the atrophy in their case if it were not a part of the myasthenia. The reflexes were normal and fibrillary tremors were absent, therefore it did not appear to be a sign of progressive spinal muscular atrophy. It developed after the symptoms of myasthenia had been present many years, and did not resemble myopathy. These authors accept atrophy as a part of the symptom-complex of myasthenia gravis, and believe that it may not develop until the other symptoms have existed many years, eighteen in their case. One reason it is not more common may be that death occurs too early. Their patient was much benefited by glycose, although psychotherapy may deserve credit for the improvement.

Marinesco⁵ has shown that myasthenia gravis may occur in two members of the same family—in two sisters—and that the myasthenic reaction to the faradic current may be produced experimentally by causing ischemia of a limb with the Esmarch bandage or hyperemia by the method of Bier. He believes there is imperfect oxygenation of the muscles in this disorder, an increase in the total nitrogen in the urine and alteration of the striated muscles and of glands, such as the parathyroids and suprarenal, and of the pituitary body. The pituitary body and the parathyroid glands present the appearance of hyperfunction.

¹ *Neurologisches Centralblatt*, November 16, 1908, p. 1066.

² *Revue Neurologique*, November 15, 1908, p. 1154.

³ *Semaine Médicale*, November 18, 1908, p. 563.

⁴ *Monatsschrift f. Psychiatrie und Neurologie*, July, 1908, p. 1

⁵ *Semaine Médicale*, September 2, 1908, p. 421.

RESEMBLANCE BETWEEN INTERMITTENT LAMENESS AND MYASTHENIA GRAVIS. The distinction between intermittent lameness and myasthenia gravis is seldom difficult, and yet it may require careful consideration. Thus, Goldstein¹ reports a case in which paresthesia, stiffness, and weakness occurred in attacks, and affected the right upper limb, both lower limbs, mouth, tongue, upper lid, and vocal cords. The symptoms were intermittent, disappeared after rest, and returned after use. There were also disturbances in the vascular system. The extent of the muscular involvement was noteworthy. The diagnosis of intermittent lameness was made, but the exhaustion after use was suggestive also of myasthenia, especially as alteration of the peripheral arteries was not present, and the myasthenic electric reaction was obtained. The pulse was absent only in one artery, the posterior tibial of one side. Failure of pulse is not always observed in intermittent lameness. The absence of true paralysis, the slower development of the exhaustion, the subjective symptoms, the cramps of the calf muscles, the pain, the vascular symptoms, the neurotic condition, made a diagnosis of intermittent lameness possible. The exhaustion was peculiar, the muscles were not flaccid, but spastic after use. The myasthenic reaction is not pathognomonic, and yet Goldstein's case seems to be the first in which it was observed as a sign of intermittent lameness. Myasthenia gravis is not infrequently unrecognized when it is really pronounced, and it behooves us to remember that it may resemble the intermittent lameness.

¹ *Neurologisches Centralblatt*, August 16, 1908, p. 754.

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